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Your ref:
Our ref: CJO-3113

By hand

Chief Engineer /Project Management
Water Supplies Department
46/F., Immigration Tower
7 Gloucester Road, Wanchai
(Attn: Mr. H C Wong, Heinz)

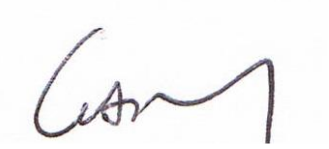
13 Aug, 2019

Dear Sir,

In-Situ Reprovisioning of Sha Tin Water Treatment Works – South Works
Environmental Permit EP-494/2015
Submission of 41st monthly EM&A Report

In accordance with the Condition 3.4 of the Environmental Permit (No. EP-494/2015), we submit herewith 5 hard copies and 2 electronic copies of the 41st monthly Environmental Monitoring and Audit (EM&A) Report (Rev.0) for your processing. I certified and confirmed the submission of this monthly EM&A Report had complied with the requirements as set out in the approved Environmental Monitoring and Audit (EM&A) Manual of the EIA Report (Register No.: AEIAR-187/2015).

Yours faithfully,



Ir Dr Lam, Gabriel, C.K.
Environmental Team Leader

c.c. Independent Environmental Checker

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Your Ref:
Our Ref: 60479142/C/fyw1908131

By Hand & By Email

Chief Engineer/Project Management
Water Supplies Department
46/F., Immigration Tower
7 Gloucester Road, Wanchai

Attn: Mr. H C Wong, Heinz

13 August 2019

Dear Sir,

Contract No.3/WSD/15q
In-situ reprovisioning of Sha Tin Water Treatment Works (South Works) Advance Works
Submission of 41st Monthly EM&A Report for July 2019

Reference is made to Environmental Team (ET)'s 41st Monthly EM&A Report for July 2019 (Rev. 0) submitted on 13 August 2019.

In accordance with the Condition 3.4 of the Environmental Permit (No.EP-494/2015), I verified and confirmed the submission of this Monthly EM&A Monitoring Report as compiled with the requirements as set in the approved Environmental Monitoring and Audit (EM&A) Manual of the EIA Report (Register No.: AEIAR-187/2015).

Should you have any queries, please feel free to contact the undersigned at 3922 9366.

Yours faithfully,
AECOM Asia Co. Ltd.

Y W Fung
Independent Environmental Checker

c.c. Environmental Team Leader

MONTHLY ENVIRONMENTAL MONITORING AND AUDIT

(EM&A) REPORT (NO. 41)

FOR

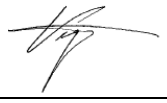
CONTRACT NO. 3/WSD/15
IN-SITU REPROVISIONING OF SHA TIN
WATER TREATMENT WORKS – SOUTH WORKS

(Rev. 0)

MONTHLY ENVIRONMENTAL MONITORING AND AUDIT (EM&A) REPORT (NO. 41) –

FOR

CONTRACT NO. 3/WSD/15
IN-SITU REPROVISIONING OF SHA TIN WATER TREATMENT WORKS – SOUTH WORKS

	Name	Signature
Prepared by	Ms, Fung Jessica	
Reviewed by	Mr. Wong, Vega, T. L.	
Approved & Certified by	Ir Leung, Jacky, C. H. Environmental Team Leader (ETL)	
Verified & Confirmed by	Mr. Fung, Y. W. Independent Environmental Checker (IEC)	

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LIST OF APPENDICES

EXECUTIVE SUMMARY

A.1 Pursuant to the Environmental Impact Assessment (EIA) Ordinance, the Director of Environmental Protection (DEP) granted the Environmental Permit (No. EP- 494/2015) to the Water Supplies Department (WSD) to construct and operate the designated project for "In-situ Reprovisioning of Sha Tin Water Treatment Works - South Works" ("The Project").

A.2 Under Contract No. 3/WSD/15, Ming Hing - Ming Hing Civil - Vasteam Joint Venture (MMVJV) is commissioned by WSD to undertake the construction of the advance works while AECOM Asia Company Limited was appointed by WSD as the Engineer. For implementation of the environmental monitoring and audit (EM&A) programme under the Contract, Acumen Environmental Engineering & Technologies Company Limited was appointed by MMVJV as the Environmental Team (ET). AECOM Asia Company Limited was also employed by the WSD as the Independent Environmental Checker (IEC).

A.3 The construction phase of the Contract commenced on 30 October 2015 for completion by 2018. The impact monitoring of the EM&A programme, including air quality, noise, water quality monitoring as well as environmental site inspections, commenced on 17 February 2016.

A.4 This is the 41st monthly Environmental Monitoring and Audit Report for this Contract covering the period from 1 July 2019 to 31 July 2019 (the Reporting Period). As informed by the Contractor, major activities in the reporting period included:

- Construction of Logistics Centre at Wall C.
- Construction lagging wall and bore piles at Wall D and C
- External finish work at North Work Temporary House
- Modification of clarifier no.1
- Modification of valve chamber and construction of flow meter house
- Construction of CLP steel cable support between CLP substation and North Work Washwater Pump House

A.5 Environmental monitoring activities under the EM&A program in this reporting period are summarized below

Issues	Environmental Monitoring Parameters / Inspection	Occasions
Air	1-Hour TSP	18
Noise	$L_{eq(30mins)}$ Daytime	6
Water Quality	Water Sampling	13
Inspection / Audit	ET Regular Environmental Site Inspection	4
	IEC Monthly Environmental Site Audit	1

A.6 No exceedance of air quality, noise and water quality monitoring were recorded in this reporting period.

A.7 No environmental complaint were received via EPD in this reporting period.

A.8 No notification of any summons and successful prosecutions was received in this reporting period.

A.9 No reporting change was made in this reporting period.

A.10 There was no EPD site inspection conducted in the reporting period.

A.11 As informed by the Contractor, the major works for this Project in July 2019 will be:

- Construction of Logistics Centre at Wall C.
- Construction lagging wall and bore piles at Wall D and C
- External finish work at North Work Temporary House
- Modification of clarifier no.1

- Modification of valve chamber and construction of flow meter house
- Construction of CLP steel cable support between CLP substation and North Work Washwater Pump House

A.12 EM&A monitoring for the 41st reporting period has been completed. The 42nd monthly EM&A report will cover the period from 1 August 2019 to 31 August 2019.

1. INTRODUCTION

1.1. PROJECT BACKGROUND

1.1.1 Pursuant to the Environmental Impact Assessment (EIA) Ordinance, the Director of Environmental Protection (DEP) granted the Environmental Permit (No. EP- 494/2015) on 28 January 2015, subsequent to approval of the EIA Report (Register No. AEIAR-187/2015), to the Water Supplies Department (WSD) to construct and operate the designated project for "In-situ Reprovisioning of Sha Tin Water Treatment Works - South Works" ("The Project").

1.1.2 Under Contract No. 3/WSD/15, Ming Hing - Ming Hing Civil - Vasteam Joint Venture (MMVJV) is commissioned by WSD to undertake the construction of the advance works while AECOM Asia Company Limited was appointed by WSD as the Engineer. For implementation of the environmental monitoring and audit (EM&A) programme under the Contract, Acumen Environmental Engineering & Technologies Company Limited was appointed by MMVJV as the Environmental Team (ET). AECOM Asia Company Limited was also employed by the WSD as the Independent Environmental Checker (IEC).

1.1.3 The construction phase of the Contract commenced on 30 October 2015 for completion by 2018. The general layout plan of the Contract components is presented in **Appendix A**.

1.1.4 ET conducted below baseline monitoring at designated locations according to the EM&A Manual.
- Air quality and noise: from 21 December 2015 to 3 January 2016.
- Water quality: from 15 December 2015 to 8 January 2016.

1.1.5 Baseline Monitoring Report was issued by the ET and verified by the IEC on 27 January 2016 and submitted to the EPD on 2 February 2016.

1.1.6 The impact monitoring of the EM&A programme, including air quality, noise, water quality monitoring as well as environmental site inspections, commenced on 17 February 2016.

1.2. ORGANIZATION STRUCTURE

1.2.1 The organization structure of the Contract is shown in **Appendix B**. Contact details of key personnel are summarized in below table:

Table 1-1: Key Personnel Contact for Environmental Works

Party	Position	Name	Telephone
Water Supplies Department	Engineer / Project Management	Mr. Chiu, Aletta C. M.	2829 5653
AECOM	Senior Resident Engineer (Civil)	Mr. Ng, Derek, K. H.	9717 1420
	Independent Environmental Checker	Mr. Fung, Y. W.	3922 9366
	Deputy Independent Environmental Checker	Ms. Lam, Lemon, M. C.	3922 9381
Ming Hing - Ming Hing Civil - Vasteam Joint Venture	Project Manager	Mr. Lam, Larry, M. W.	6478 0501
	Site Agent	Mr. To, Eros, W. H.	9223 9590
Acumen Env. Eng. & Tech. Co. Ltd.	Project Director	Ir Dr. Lam, Gabriel, C. K.	2333 6823
	Environmental Team Leader	Ir Leung, Jacky, C. H.	9060 2368
	Ecologist	Mr. Liu, Vincent, W. L.	6505 5827

1.3. SCOPE OF REPORT

1.3.1 This is the 41st monthly EM&A Report under the Contract No. 3/WSD/15 In-situ Reprovisioning of Sha Tin Water Treatment Works (South Works) – Advance Works covering the period from 1 July 2019 to 31 July 2019 (the reporting period).

1.3.2 The EM&A requirements for impact monitoring are set out in the approved EM&A Manual. Environmental aspects such as the construction air quality, noise, water quality and ecology were identified as the key issues during the construction phase of the Project.

1.4. SUMMARY OF CONSTRUCTION WORKS

1.4.1 The construction phase of the Contract commenced on 30 October 2015. Latest construction programmes is shown in **Appendix C**.

1.4.2 As informed by the Contractor, details of the major works carried out in this reporting month are listed below:

- Construction of Logistics Centre at Wall C.
- Construction lagging wall and bore piles at Wall D and C
- External finish work at North Work Temporary House
- Modification of clarifier no.1
- Modification of valve chamber and construction of flow meter house
- Construction of CLP steel cable support between CLP substation and North Work Washwater Pump House

1.4.3 The locations of the construction activities are shown in **Appendix D**. The Environmental Sensitive Receivers in the vicinity of the Project are shown in **Appendix E.**

2. EM&A RESULTS

2.1. EM&A BACKGROUND

2.1.1 The EM&A programme required environmental monitoring for air quality, noise, water quality and ecology as well as environmental site inspections for air quality, noise, water quality, waste management and ecology impacts. The EM&A requirements and related findings for each component are summarized in the following sections. A summary of impact monitoring programme is presented in Table 2-1.

Table 2-1: Summary of Impact Monitoring Programme

Impact Monitoring	Sampling Parameter	Frequency
Air Quality	1-hour TSP	3 times in every 6 days when documented and valid complaint was received
Noise	$L_{eq\ 30\ min}$, $L_{eq\ 5\ min}$, L_{10} and L_{90} as reference.	1 time per week: ◆ $L_{eq\ 30\ min}$ for normal weekdays from 0700 - 1900;
Water Quality	Duplicate in-situ measurements: Dissolved Oxygen (DO), Turbidity and pH; HOKLAS-accredited laboratory analysis: Suspended Solids (SS).	3 days per week. The interval between 2 monitoring days will be more than 36 hours.
Ecology	-	A detailed at least 6 years post-planting monitoring and maintenance programme

Remark: Sampling Depth for Water Quality:

(i) 3 depths: 1m below water surface, 1m above bottom and at mid-depth when the water depth exceeds 6m.

(ii) If the water depth is between 3m and 6m, 2 depths: 1m below water surface and 1m above bottom.

(iii) If the water depth is less than 3m, 1 sample at mid-depth is taken

2.1.2 A summary of the monitoring parameters is presented in Table 2-2.

Table 2-2: Summary of the monitoring parameters of EM&A Requirements

Environmental Issue	Parameter
Air Quality	● 1-hour TSP Monitoring by Real-Time Portable Dust Meter
Noise	● $L_{eq\ (30min)}$ during normal working hours
Water Quality	In-situ measurement ● Dissolved Oxygen (mg/L); ● Dissolved Oxygen Saturation (%); ● Turbidity (NTU); ● pH value; ● Water depth (m); and ● Temperature (ºC)
	Laboratory analysis ● Suspended Solids (mg/L)

2.1.3 Summary of determination of Action/Limit (A/L) Levels for air quality, noise and water quality are presented in **Appendix F**.

2.1.4 Should non-compliance of the environmental quality criteria occurs, remedial actions will be triggered according to the Event and Action Plan enclosed in **Appendix G**.

2.1.5 The impact monitoring schedules are presented in **Appendix H** and the monitoring results are detailed in the following sub-sections.

2.2. AIR QUALITY MONITORING

2.2.1 Impact monitoring for air quality had been carried out in accordance with Sections 2.29 of the approved EM&A Manual to determine the ambient 1-hour total suspended particulates (TSP) levels at the monitoring locations. 1-hour TSP sampling should be undertaken at least 3 times in every six-days at each monitoring station when the highest dust impacts are expected. General meteorological conditions (wind speed, direction and precipitation) and notes regarding any significant adjacent dust producing sources had also been recorded throughout the impact monitoring period.

2.2.2 Two (2) designated monitoring stations, AM1 located at the L Louey and AM2 located at Hin Keng Estate - Hin Wan House, were recommended in Section 2.18 of the approved EM&A Manual. In order to identify and seek for the access of the air monitoring locations designated in the EM&A Manual, site visit was conducted among ET, IEC and EPD.

2.2.3 During the site visit, all designated air monitoring locations were identified. Details of air monitoring stations are described in Table 2-3. The location plan of air quality monitoring stations is shown in **Appendix I**.

Table 2-3: Location of the Air Quality Monitoring Stations

Air Quality Monitoring Station	Air Sensitive Receiver (ASR) ID in the approved EIA Report	Dust Monitoring Station
AM1	ASR2	The L Louey (at a platform level of about 5m above road level nearby)
AM2	ASR4	Hin Keng Estate - Hin Wan House (at the roof top)

2.2.4 The monitoring equipment using for the air quality impact monitoring was proposed by ET and verified by IEC. 1-hour TSP levels had been measured with direct reading dust meter. It has been demonstrated its capability in achieving comparable results with high volume sampling method as set out in the Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50). The details of equipment using for impact monitoring are listed in Table 2-4 as below.

Table 2-4: Air Quality Impact Monitoring Equipment

Equipment	Model
Portable dust meter – 1-hour TSP	TSI Model 8532
Portable Wind Speed Indicator	The Kestrel Pocket Weather Meter

2.2.5 The 1-hour TSP meter provides a real time 1-hour TSP measurement based on 90^{o} light scattering. The 1-hour TSP monitor consists of the following:

- A pump to draw sample aerosol through the optic chamber where TSP is measured;
- A sheath air system to isolate the aerosol in the chamber to keep the optics clean for maximum reliability; and

- A built-in data logger compatible with based program to facilitate data collection, analysis and reporting.

2.2.6 The 1-hour TSP meter was calibrated by the manufacturer prior to purchasing. Zero response of the instrument was checked before and after each monitoring event. Operation of the 1-hour TSP meter followed manufacturer's Operation and Service Manual. A valid calibration certificate is attached in **Appendix J**.

2.2.7 In this Reporting Period, a total of six (6) sampling days perform air quality monitoring at the two designated locations. The results for 1-hour TSP are summarized in Table 2-5 and Table 2-6.

Table 2-5: Summary of 1-hour TSP Monitoring Results – AM1

Date	**Weather**	**1-hour TSP (μg/m^3)**				
		Start Time	**End Time**	**1st Measurement**	**2nd Measurement**	**3rd Measurement**
2/7/2019	Cloudy	10:25	13:25	108	112	119
8/7/2019	Fine	09:28	12:28	106	118	110
12/7/2019	Sunny	09:15	12:15	118	111	109
17/7/2019	Cloudy	13:05	16:05	121	135	140
22/7/2019	Cloudy	13:35	16:35	110	132	139
26/7/2019	Cloudy	10:11	13:11	118	125	119
Average				**119**		
Range				**106-140**		

Table 2-6: Summary of 1-hour TSP Monitoring Results – AM2

Date	**Weather**	**1-hour TSP (μg/m^3)**				
		Start Time	**End Time**	**1st Measurement**	**2nd Measurement**	**3rd Measurement**
2/7/2019	Cloudy	10:35	13:35	114	126	131
8/7/2019	Fine	09:40	12:40	110	122	128
12/7/2019	Sunny	09:25	12:25	120	125	148
17/7/2019	Cloudy	13:19	16:19	151	159	149
22/7/2019	Cloudy	13:40	16:40	128	160	152
26/7/2019	Cloudy	10:28	13:28	129	134	150
Average				**135**		
Range				**110-160**		

2.2.8 In this Reporting Month, all monitoring result were below the action level. Hence, no Action or Limit Level exceedance was triggered during this month. The impact air quality monitoring results and graphical presentation are shown in **Appendix K**.

2.3. NOISE MONITORING

2.3.1 Impact monitoring for noise levels had been measured in accordance with Sections 3.13 of approved EM&A Manual on normal weekdays at a frequency of once a week at logging interval of 30 minutes for daytime (between 0700 and 1900 hours of normal weekdays). The L_{eq} had been recorded at the specified intervals. The non-project related construction activity – Sha Tin to Central Link (SCL) for Hin Keng to Diamond Hill Tunnel, in the vicinity of the monitoring stations during the impact monitoring had been noted and the source and location of this activity had been recorded.

2.3.2 According to Section 3.7 of the approved EM&A Manual, 3 noise sensitive receivers designated for the construction noise monitoring. The designated monitoring stations are identified and successfully granted by the premises. The details of noise monitoring stations are described in Table 2-7 and the location plan of noise monitoring stations is shown in **Appendix L**.

Table 2-7: Details of Noise Monitoring Stations

Noise Monitoring Station	Noise Sensitive Receiver (NSR) ID in the approved EIA Report	Identified Noise Monitoring Station
NM1	HK2	The L Louey (South) (at a platform level of about 5m above road level nearby - free field measurement)
NM2	HK5	Hin Keng Estate – Hin Wan House (at the roof level - facade measurement)
NM3	HK7	C.U.H.K.F.A.A. Thomas Cheung School (at the roof level - free field measurement)

2.3.3 The monitoring equipment using for the noise impact monitoring was proposed by ET and verified by IEC. Sound level meter in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications has been used for carrying out the noise monitoring. The sound level meter has been checked using an acoustic calibrator. The wind speed has been checked with a portable wind speed meter capable of measuring the wind speed in m/s. The details of equipment using for impact monitoring are listed in Table 2-8 as below.

Table 2-8: Noise Impact Monitoring Equipment

Noise	
Sound Level Meter	NTi Audio XL2
Acoustic Calibrator	Rion NC-74
Portable Wind Speed Indicator	The Kestrel Pocket Weather Meter

2.3.4 All noise measurements were the meter set to FAST response and on the A-weighted equivalent continuous sound pressure level (L_{eq}).

2.3.5 Prior to the impact noise measurement, the accuracy of the sound level meter was checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Regular checking

was conducted in impact monitoring period. The calibration level before and after the noise measurement is agreed to within 1.0 dB.

2.3.6 An acoustic calibrator and sound level meter using impact monitoring is within the valid period and were calibrated per year. A set of valid calibration certificates is attached in **Appendix M**.

2.3.7 Noise measurements should not be made in presence of fog, rain, wind with a steady speed exceeding 5 ms^{-1} or wind with gusts exceeding 10 ms^{-1}. The wind speed was checked with a portable wind speed meter capable of measuring with speeds in ms^{-1}.

2.3.8 In this Reporting Period, a total six (6) occasions noise monitoring was undertaken in Reporting period. The noise monitoring results at the designated locations are summarized in Tables 2-9 to 2-11.

Table 2-9: Summary of Noise Monitoring Results – NM1

Date	**Time**	**Weather**	**1st Leq_{5min}**	**2nd Leq_{5min}**	**3rd Leq_{5min}**	**4th Leq_{5min}**	**5th Leq_{5min}**	**6th Leq_{5min}**	**Leq_{30min}**
2/7/2019	10:45 - 11:15	Cloudy	60.8	62.4	60.2	61.3	59.5	59.1	60.7
8/7/2019	09:48 - 10:18	Fine	60.9	61.5	62.3	61.2	59.5	59.9	61.0
12/7/2019	09:45 - 10:15	Sunny	60.2	59.8	62.2	60.0	58.9	58.7	60.1
17/7/2019	13:28 - 13:58	Cloudy	60.3	61.2	62.1	61.0	62.3	61.4	61.4
22/7/2019	13:51 - 14:21	Cloudy	61.5	60.8	61.9	62.1	61.0	61.5	61.5
26/7/2019	10:45 - 11:15	Cloudy	59.8	59.4	61.2	60.2	60.1	60.0	60.2
Limit Level >75dB(A)								**Average**	**60.8**
								Range	**60.1-61.5**

Table 2-10: Summary of Noise Monitoring Results – NM2

Date	**Time**	**Weather**	**1st Leq_{5min}**	**2nd Leq_{5min}**	**3rd Leq_{5min}**	**4th Leq_{5min}**	**5th Leq_{5min}**	**6th Leq_{5min}**	**Leq_{30min}**
2/7/2019	11:30 - 12:00	Cloudy	61.2	59.6	60.8	60.2	61.2	59.2	60.4
8/7/2019	10:28 - 10:58	Fine	59.6	60.5	60.4	59.4	59.2	59.0	59.7
12/7/2019	10:22 - 10:52	Sunny	60.2	60.0	59.5	59.8	61.2	61.8	60.5
17/7/2019	14:10 - 14:40	Cloudy	61.5	61.8	62.1	60.2	61.2	61.8	61.5
22/7/2019	14:38 - 15:08	Cloudy	61.0	61.3	62.5	61.5	62.6	60.4	61.6
26/7/2019	11:32 - 12:02	Cloudy	60.3	59.8	60.2	61.5	61.0	61.0	60.7
Limit Level >75dB(A)								**Average**	**60.7**
								Range	**59.7-61.6**

Table 2-11: Summary of Noise Monitoring Results – NM3

Date	Time	Weather	1st Leq_{5min}	2nd Leq_{5min}	3rd Leq_{5min}	4th Leq_{5min}	5th Leq_{5min}	6th Leq_{5min}	Leq_{30min}
2/7/2019	12:19 - 12:49	Cloudy	62.5	62.1	61.0	61.8	61.5	61.3	61.7
8/7/2019	11:15 - 11:45	Fine	60.8	60.7	61.3	61.0	61.4	61.8	61.2
12/7/2019	11:07 - 11:37	Sunny	60.9	61.4	61.1	61.0	61.0	60.2	60.9
17/7/2019	14:55 - 15:25	Cloudy	62.1	62.8	61.8	61.9	63.0	61.4	62.2
22/7/2019	15:25 - 15:55	Cloudy	61.5	62.6	61.8	61.3	61.4	62.6	61.9
26/7/2019	12:29 - 12:59	Cloudy	63.0	62.5	62.8	62.9	63.1	61.0	62.6
Limit Level 70dB(A) during normal teaching periods or 65 dB(A) during examination periods*								**Average**	**61.8**
								Range	**60.9-62.6**

2.3.9 As shown in the results were well below the limit level, also no complaint was received by the RE, WSD, EPD and contractor. Hence, no Action or Limit Level exceedance was triggered during this month. The impact noise quality monitoring results and graphical presentation are shown in **Appendix N**.

2.4. WATER QUALITY MONITORING

2.4.1 Water Impact monitoring had been taken three days per week with sampling or measurement in accordance with Sections 4.12 of the approved EM&A Manual at all designated monitoring stations in the 2 water courses. The interval between 2 sets of monitoring had been more than 36 hours. Replicate in-situ measures had been carried out in each sampling event.

2.4.2 Three (3) control and two (2) impact stations were recommended in the Section 4.7 of the approved EM&A Manual to carry out water quality monitoring. In order to identify and seek for the access of the water monitoring locations designated in the approved EM&A Manual, site visit was conducted among ET, IEC and Environmental Protection Department (EPD).

2.4.3 During the site visit, all designated monitoring locations were identified however one more impact stations (M3) along the same water course was introduced due to the concern on multiple site effect, in particular to address the potential impact to M2 from a source at upstream of the water course. Details and coordinates of the monitoring stations are described in Table 2-12 and the location plan of water quality monitoring stations is shown in **Appendix O**.

Table 2-12: Details of Water Quality Monitoring Station

Water Quality Monitoring Station	Description	Co-ordinates	
		Easting	Northing
C1	Control Stations	835110	824716
C2		835403	824470
C3		835642	824386
M1	Impact Monitoring Stations	835215	824827
M2		835536	824775
M3		835501	824648

2.4.4 The water monitoring equipment and analysis using for the water quality monitoring were proposed by ET and verified by IEC. The details of equipment using for impact monitoring are listed in the Table 2-13 below:

Table 2-13: Monitoring Equipment Used in Impact Monitoring Program

Water quality	
HORIBA Professional DSS Multifunctional Meter	
Thermometer & DO meter	The instrument is a portable and weatherproof dissolved oxygen (DO) measuring instrument complete with cable and sensor, and use a DC power source. The equipment is capable of measuring as included a DO level in the range of 0 - 20mg/L and 0 - 200% saturation; and a temperature of 0 - 45°C.
pH meter	The instrument consists of a potentiometer, a glass electrode, a reference electrode and a temperature-compensating device. It is readable to 0.1 pH in range of 0 to 14.
Turbidmeter	The instrument is a portable and weatherproof turbidity measuring instrument using a DC power source. It has a photoelectric sensor capable of measuring turbidity between 0 - 1000 NTU.
Laboratory Analysis	
Suspended Solids	HOKLAS-accredited laboratory (Acumen Laboratory and Testing Limited)

Remark:

(i) Water samples for suspended solids (SS) have been stored in high density polythene bottles with no preservative added, packed in ice (cooled to 4°C without being frozen).

2.4.5 Before the commencement of the sampling, general information such as the date and time of sampling as well as the personnel responsible for monitoring were recorded on the monitoring field data sheet.

2.4.6 Water temperature, turbidity, DO, pH and water depth were measured in-situ. Since water depths at C1, C2, M1, M2 and M3 were less than 3 m, all in-situ measurements and sampling conducted at one water depth such as mid-depth are performed. Moreover, C3 was recorded dry throughout the sampling period. Therefore, in-situ measurements and sampling could not be conducted at C3 in accordance with the water monitoring requirements in the approved EM&A Manual.

2.4.7 At each sampling point, (two) 2 consecutive measurements of temperature, DO, turbidity and pH were measured. The Multi-Parameter Water Quality Monitoring Probe were retrieved out of the water after the first measurement and then re-deployed for the second measurement. Where the difference in the value between the first and second readings of each set was more than 25% of the value of the first reading, the reading was discarded and further readings were taken. The certification of the Multi-parameter Water Quality Monitoring System is showed in **Appendix P**.

2.4.8 All water samples were delivered to the Acumen Laboratory and Testing Limited (HOKLAS registration no.: 241). SS testing was used HOKLAS accredited Analytical method APHA 2540 D. The certification of laboratory with HOKLAS accredited analytical tests are provided in **Appendix Q**.

2.4.9 In this reporting period, a total of twelve (12) sampling days perform water monitoring at the six designated locations. Monitoring results of 4 key parameters: dissolved oxygen (DO), turbidity, suspended solids and pH in this Reporting Months, are summarized in Table 2-14.

Table 2-14: Summary of Water Quality Monitoring Results

Dissolved Oxygen – Mid Depth (mg/L)	**C1**	**C2**	**C3**	**M1**	**M2**	**M3**
Average	8.55	8.56	N/A	9.13	9.19	9.41
Min.	8.20	8.33	N/A	8.97	8.91	9.25
Max.	8.79	8.79	N/A	9.31	9.32	9.59
Turbidity – Mid Depth (NTU)	C1	C2	C3	M1	M2	M3
Average	2.48	2.58	N/A	2.05	1.82	0.57
Min.	2.30	2.40	N/A	1.80	1.50	0.40
Max.	2.70	2.80	N/A	2.30	2.10	0.90
Suspended Solid – Mid depth (mg/L)	C1	C2	C3	M1	M2	M3
Average	4.97	5.60	N/A	3.01	5.57	<1
Min.	4.10	4.50	N/A	2.80	4.50	<1
Max.	6.20	6.60	N/A	3.30	6.40	<1
pH value (unit)	C1	C2	C3	M1	M2	M3
Average	7.65	7.54	N/A	7.63	7.68	7.56
Min.	7.31	7.24	N/A	7.30	7.50	7.11
Max	7.85	7.86	N/A	7.81	7.78	7.71

2.4.10 In this Reporting Month, all monitoring result were below or within the action level. Hence, no Action or Limit Level exceedance was triggered during this month. Detailed monitoring results including in-situ measurements, laboratory analysis data are shown in **Appendix R**.

2.5. ECOLOGY

2.5.1 Detailed Vegetation Survey Report and Woodland Compensation Plan submitted to EPD and approved on 17 February 2016. To ensure the planting works are properly implemented, bi-weekly monitoring is proposed throughout the planting phase. The frequency of monitoring is proposed to be bi-monthly during the first years of the planting stage, and then reduced to quarterly for the six (6) year post-planting period.

2.5.2 A 6 years post-planting review report will be submitted within a month after completion of the at least 6 years post-planting monitoring and maintenance.

2.5.3 Monitoring inspections were conducted on 23 & 31 July 2019. Three trees TA572, TA326 and TA327 were transplanted to tree compensation area within the Sha Tin Water Treatment Works (STWTW) in 20 June 2016.

2.5.4 The condition of TA572 was observed in poor condition due to the damage of two main trunks. TA327 was also in poor condition. The already dead tree TA326 collapsed due to big hit by the Signal No.10 typhoon Mangkhut on 16 September 2018. Tree guying cables have been installed to provide external support to the remaining two transplanted trees. Transplanted Lamb of Tartary (Cibotium barometz) seems to be received too much sunlight. Leaves of them were observed yellowish in colour. On the other hand, young foliage was growing out to replace the old one.

2.5.5 Since Sha Tin South Fresh Water Service Reservoir (STSFWSR) was still under preparation, Lamb of Tartary was still temporally stored in a nursery garden at Wang Toi Shan, Kam Tin.

2.5.6 In general, all transplanted Lamb of Tartary (Cibotium barometz) were in fair condition while Hong Kong Eagle's Claw (Artabotrys hongkongensis) was observed dead during inspection on 20 August 2016. The survival rate for Lamb of Tartary (Cibotium barometz) and Hong Kong Eagle's Claw (Artabotrys hongkongensis) was 96%. The Summary table for health condition and survival rate was shown in Appendix II.

2.5.7 All transplanted Lamb of Tartary (Cibotium barometz) have been severely damaged by Typhon Wipha on 30-31 July 2019; the next few monitoring will be critical to assess their survival and recovery progress.

2.5.8 It is recommended to retain transplanted Lamb of Tartary (Cibotium barometz) at the nursery garden under proper maintenance during current recovery stage. Once their condition has recovered to acceptable level, they can be moved to the transplantation site at Sha Tin South Fresh Water Service Reservoir (STSFWSR) when the site is ready.

2.5.9 After transplantation, root ball of TA572 and TA327 tree should be kept moisture especially during non-raining day.

2.6. WASTE MANAGEMENT STATUS

2.6.1 The Contractor has submitted application form for registration as chemical waste producer under the Contract. Sufficient numbers of receptacles were available for general refuse collection and sorting. The Waste Producer Number to the Contractor is assigned in respect of the project site.

2.6.2 Wastes generated during this reporting period include mainly construction wastes (inert and non-inert). Waste flow table was prepared by the Contractor to record amount of waste generated and disposed (**Appendix T**).

2.6.3 The Contractor was advised to properly maintain on site C&D materials and waste collection, sorting and recording system, dispose of C&D materials and wastes at designated ground and maximize reuse/ recycle of C&D materials and wastes.

2.6.4 The Contractor was also reminded to properly maintain the site tidiness and dispose of the wastes accumulated on site regularly and properly. For chemical waste containers, the Contractor was reminded to treat properly and store temporarily in designated chemical waste storage area on site in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.

2.7. DELIVERY, STORAGE AND HANDLING OF CHLORINE

2.7.1 Chlorine is delivered to Sha Tin WTW in batches of up to 6×1-tonne drums. The transport route from Sham Shui Kok dock on North Lantau is shown in **Figure 1**. The route passes along the North Lantau

Expressway, around the northern edge of Tsing Yi, through Tsuen Wan and along Tai Po Road (Piper's Hill) to Sha Tin (Table 2-15).

Figure 1: Chlorine Transport Route to Sha Tin Water Treatment Works

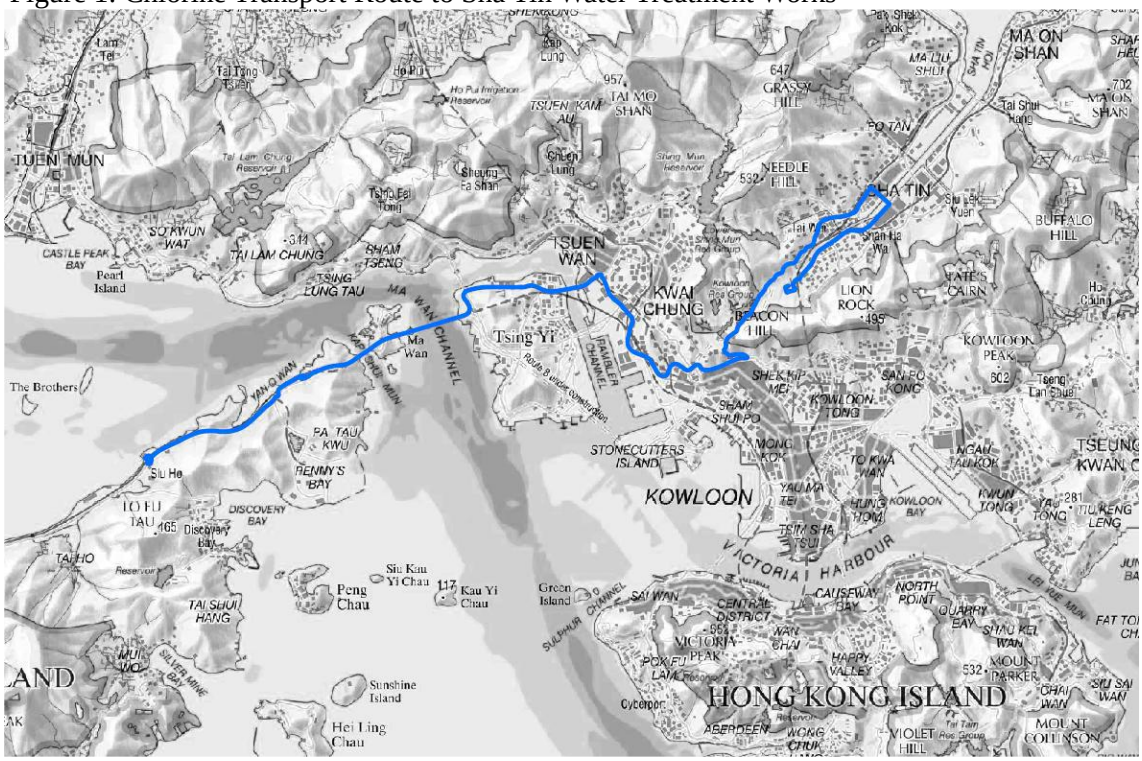


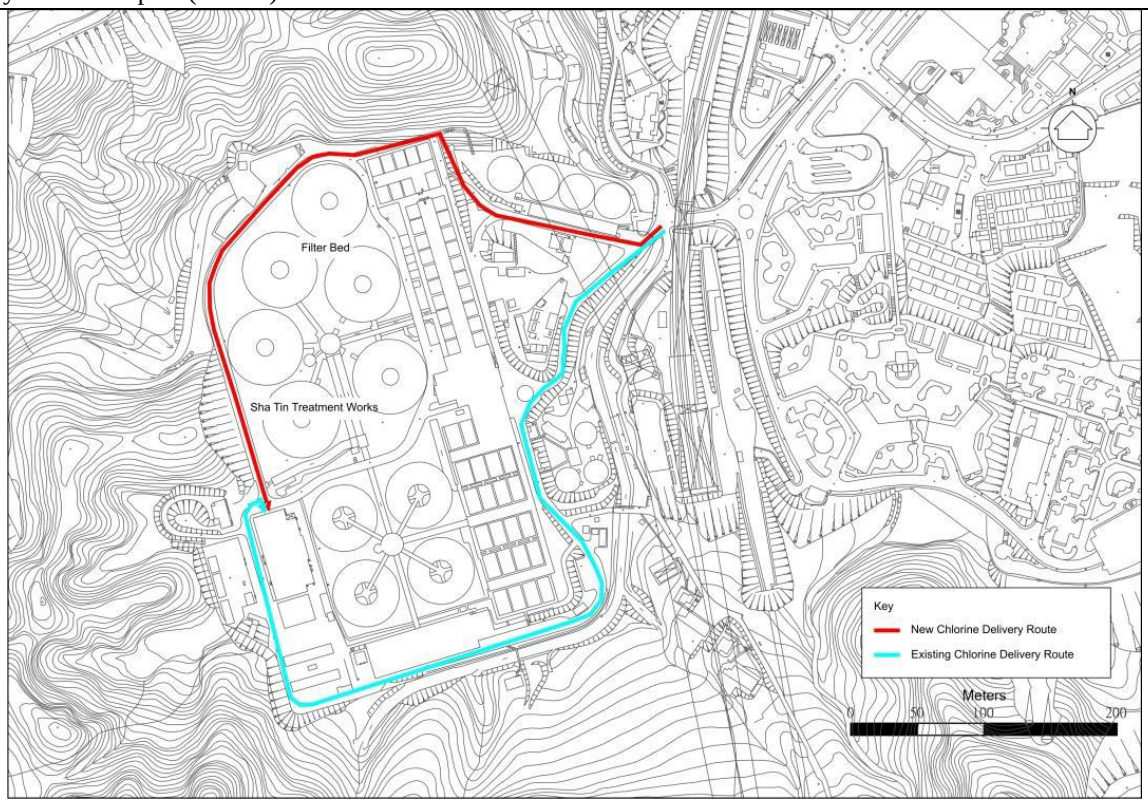
Table 2-15: Chlorine Truck Transport Route

Destination	Route
From SSK Dock to Sha Tin WTW	Sham Shui Kok Dock > Cheung Tung Road > Sunny Bay Road > N Lantau Highway > Lantau Link > NW Tsing Yi Interchange > Tsing Yi North Costal road > Tsing Tsuen Road > Tsuen Wan Road > Kwai Chung Road > Ching Cheung Road > Tai Po Road > Tai Po Road (Piper's Hill) > Tai Po Road (Sha Tin Heights) > Tai Po Road > Tsing Sha Highway (Sha Tin) > Tai Po Rd (Sha Tin) > Sha Tin Rural Committee Rd > Tai Chung Kiu Rd > Che Kung Miu Road > Sha Tin WTW

2.7.2 Unloading takes place inside the Chlorination House, with the doors closed, in a designated truck unloading bay. The movement of drums within the storage area and 'drive-through' unloading bay is carried out using a hoist/monorail system with a purpose-built lifting beam. Prior to usage, the drums are stored on cradles within the chlorine storage area.

2.7.3 The on-site chlorine delivery route is shown in Figure 2.

Figure 2: Chlorine Delivery Route at Sha Tin WTW



2.7.4 An emergency chlorine scrubbing system is installed to remove any leaked chlorine in the chlorine handling and storage areas. The system is a packed tower utilising sodium hydroxide as the neutralising agent. The plant and equipment are installed in a separate scrubber room.

2.7.5 On detection of chlorine at a concentration of 3 ppm or above in the chlorine handling or storage areas, the scrubbing system will activate automatically. The air/chlorine mixture in the affected areas is drawn into the scrubber by the scrubber fan via ducting connected to the normal ventilation system. An electrically-operated isolating damper is provided in the scrubber intake which opens automatically when the scrubber fan starts up.

2.7.6 The scrubber system is normally set at auto standby mode and is activated if the chlorine concentration rises above 3 ppm. A continuous chlorine monitor is installed at a point downstream of the packed tower and upstream of the vent/recycle changeover dampers to monitor the scrubber performance; a “Chlorine concentration high” alarm will be initiated if the concentration of chlorine in the tower exhaust exceeds the preset value.

2.7.7 According to the Fire Services Department’s fire safety requirements, an emergency repair/stoppage kit for chlorine spillage/leakage is provided and maintained in good working condition at all times for use

by the trained persons and stowed adjacent to but outside the store/plant room. Regular drills are conducted to train personnel on the proper use of the breathing apparatus and protective clothing.

2.7.8 A Hazard Assessment of the risks associated with the storage, handling and transport of chlorine at Sha Tin WTW and the off-site transport of chlorine for the Construction and Operational Phases of the reprovisioning project has been conducted in the approved EIA Report (Register No. AEIAR-187/2015).

2.7.9 This In-situ Reprovisioning of Sha Tin WTW is an improvement project, following its completion the chlorine-related risks levels to the general public will be lowered due to the anticipated reduction of the chlorine storage and usage levels.

2.7.10 Implementation of the recommended mitigation measures would be regularly audited. No specific Environmental Monitoring would be required.

2.8. EM&A SITE INSPECTION

2.8.1 Site inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures under the Contract. In the reporting period, four (4) site inspections were carried out on 4, 11, 18 and 25 July 2019.

2.8.2 One joint site inspection with IEC also undertaken on 18 July 2019. Minor deficiencies were observed during weekly site inspection or joint site inspection. Key observations during the site inspections are summarized in Table 2-16.

Table 2-16: Site Observations

Date	Environmental Observations	Follow-up Status
4 July 2019	1. Cover of general refuse bin was found broken at Logistic Center. The Contractor was reminded to replace the broken cover.	1. Broken cover was replaced.
11 July 2019	1. Stockpile of dusty material was found without impervious cover at North Circulation Road. The Contractor was reminded to cover dusty material with impervious sheeting.	1. Impervious cover was provided.
18 July 2019	1. Decolored NRMM label was observed on the generator at Wall D. The Contractor was reminded to replace it to the proper NRMM label. 2. Haul road was observed to be dry at North Circulation Road. The Contractor was reminded to provide proper water spraying on the haul road for dust suppression. 3. Accumulation of domestic waste were observed.	1. NRMM Label was replaced. 2. Regular watering was applied afterwards 3. Domestic waste were clean up regularly.
25 July 2019	1. Decolored NRMM label was observed on the generator at Wall D. The Contractor was reminded to replace it to the proper NRMM label.	1. NRMM Label was replaced.

i. The Contractor has rectified all of the observations identified during environmental site inspections in the reporting period.

2.9. ENVIRONMENTAL LICENSES AND PERMITS

2.9.1 The status of environmental license and permit is summarized in Table 2-17 below:

Table 2-17: Summary of Environmental License and Permit

License / Permit	License / Permit No.	Date of Issue	Date of Expiry	License / Permit Holder	Remark
Environmental Permit	EP- 494/2015	28/01/2015	N/A	WSD	
Registration of Chemical Waste Producer	WPN5218-759 -M2936-01	31/12/2015	N/A	MMVJV	
Trip Ticket (Chit) Account	7023723	10/12/2015	N/A	MMVJV	
Waste Water Discharge License (Wall C)	WT0023932 -2016	01/04/2016	31/03/2021	MMVJV	

License / Permit	License / Permit No.	Date of Issue	Date of Expiry	License / Permit Holder	Remark
Waste Water Discharge License (Wall D)	WT0024211 -2016	10/06/2016	30/06/2021	MMVJV	
Construction Noise Permit	GW-RN0235-19	06/06/2019	18/08/2019	MMVJV	

2.10. IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

2.10.1 In response to the site audit findings, the Contractors carried out corrective actions. A summary of the environmental mitigation measures implemented by the Contractor in this Reporting Period are summarized in Table 2-18.

2.10.2 The environmental mitigation measures that recommended in the Implementation Schedule for Environmental Mitigation Measures (EMIS) in the approved EM&A Manual covered the issues of dust, noise, water and waste and they are showed **Appendix U**.

Table 2-18: Environmental Mitigation Measures

Issues	Environmental Mitigation Measures
Air Quality	- Tarpaulin covering of any dusty materials on a vehicle leaving the site; - Imposition of speed controls for vehicles on site haul roads; - Use of regular watering to reduce dust emissions from exposed site surfaces and roads; - Side enclosure and covering of any aggregate or stockpiling of dusty materials to reduce emissions; - Where possible, routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs.
Noise	- Good site practices to limit noise emissions at the sources; - Use of quite plant and working methods; - Use of site hoarding or other mass materials as noise barrier to screen noise at ground level of NSRs; - Scheduling of construction works outside school examination period in critical area.
Water	- Drainage systems were regularly and adequately maintained; - Effluent discharged from the construction site should comply with standards stipulated in the TM-DSS; - Open stockpiles of construction materials on sites should be covered.
General	- The site was generally kept tidy and clean.

2.10.3 The necessary mitigation measures were implemented properly for this Contract.

2.11. SUMMARY OF EXCEEDANCES OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMIT

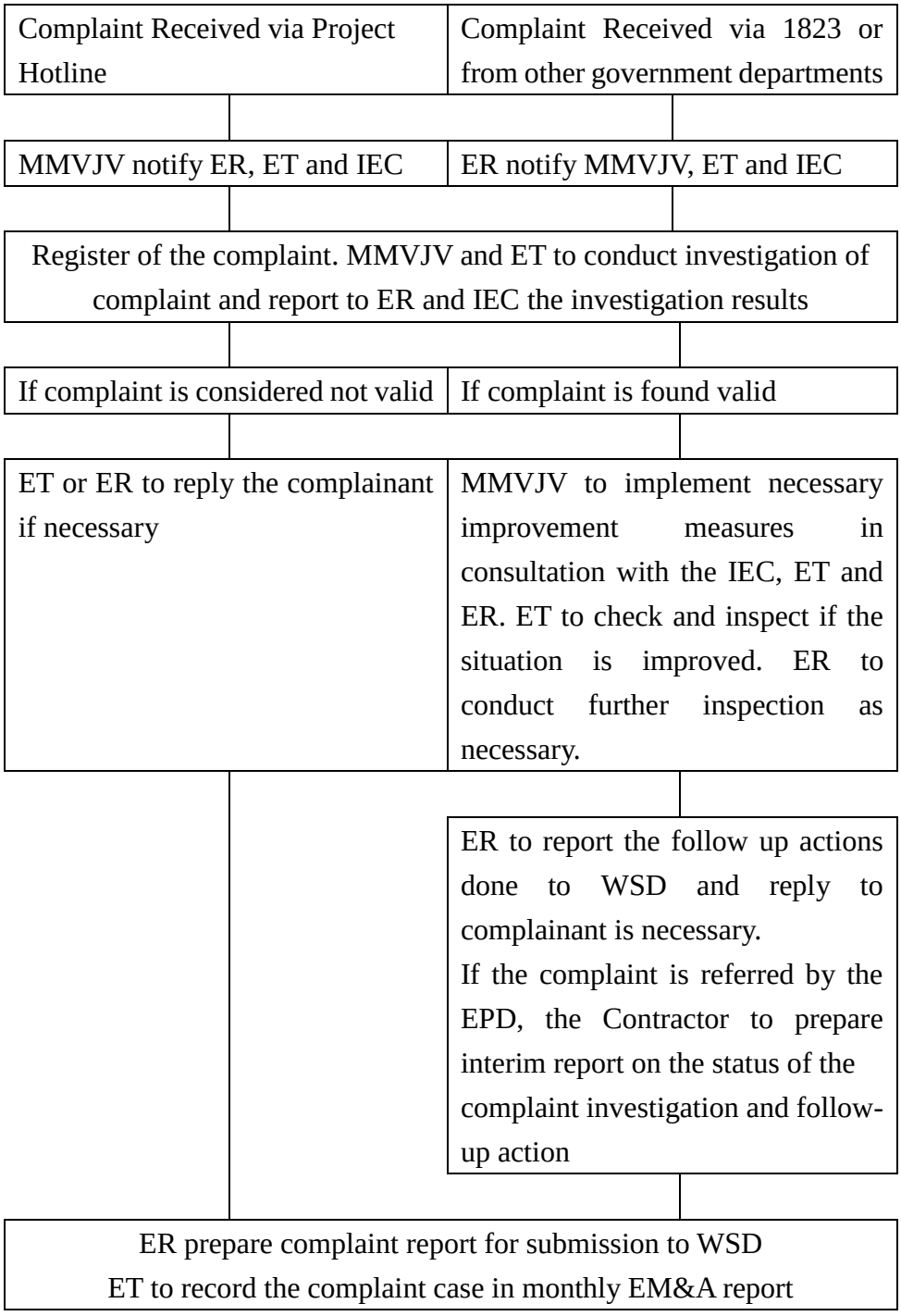
2.11.1 Results for 1-hour TSP, noise and water quality monitoring complied with the Action/ Limit levels in the reporting period.

2.11.2 Cumulative statistics on exceedances is provided in **Appendix V**.

2.12. SUMMARY OF COMPLAINTS, NOTIFICATION OF SUMMONS AND PROSECUTIONS

2.12.1 The Environmental Complaint Handling Procedure is shown in below table:

Table 2-19: Environmental Complaint Handling Procedure



2.12.2 No environmental complaint were received in the reporting period.

2.12.3 No notification of summons and prosecution was received in the reporting period.

2.12.4 No visit from EPD in the reporting period.

2.12.5 Statistics on complaints, notifications of summons and successful prosecutions are summarized in **Appendix V**.

2.13. DATA MANAGEMENT AND DATA QA/QC CONTROL

2.13.1 The impact monitoring data were handled by ET's in-house data recording and management system.

2.13.2 The monitoring data recorded in the equipment were downloaded directly from the equipment at the end of each monitoring day. The downloaded monitoring data were input into computerized database properly. The laboratory results were input directly into the computerized database and checked by personnel other than those who had input the data.

2.13.3 For monitoring parameters that require laboratory analysis, the local laboratory had followed the QA/QC requirements as set out under the HOKLAS scheme for the relevant laboratory testing.

3. FUTURE KEY ISSUES

3.1. CONSTRUCTION PROGRAMME FOR THE COMING MONTHS

3.1.1 As informed by the Contractor, the major works for this Project in August 2019 to October 2019 will be:

- Construction of Logistics Centre at Wall C.
- Construction lagging wall and bore piles at Wall D and C
- External finish work at North Work Temporary House
- Modification of clarifier no.1
- Modification of valve chamber and construction of flow meter house
- Construction of CLP steel cable support between CLP substation and North Work Washwater Pump House

3.2. KEY ISSUES FOR COMING MONTH

3.2.1 Potential environmental impacts arising from the above upcoming construction activities in August 2019 are mainly associated with dust, noise, water quality issues and waste management issues.

3.2.2 Particular issues to be considered in the coming month include:

- Implementation of dust suppression measures at all times.
- Implementation of adequate measures to prevent discharge of site effluent to the nearby water bodies
- Desilting tanks and catch-pits should be regularly maintained.
- Implementation of construction noise preventative control measures.
- Avoidance of accumulation of stagnant water

3.2.2 The tentative monitoring schedule for August 2019 to October 2019 can be found in **Appendix W**.

4. CONCLUSIONS AND RECOMMENDATIONS

4.1. SUMMARY

4.1.1 Air quality (including 1-hour TSP), noise, water quality and ecology impact monitoring were carried out in the reporting period. All monitoring results are satisfactory and no NOEs or associated corrective action was therefore issued.

4.1.2 Four (4 nos.) environmental site inspection were conducted during the reporting period. Joint site inspection with IEC were carried out on 18 July 2019. Minor deficiencies were observed during site inspection and were rectified within the specified deadlines. The environmental performance of the Project was therefore considered satisfactory.

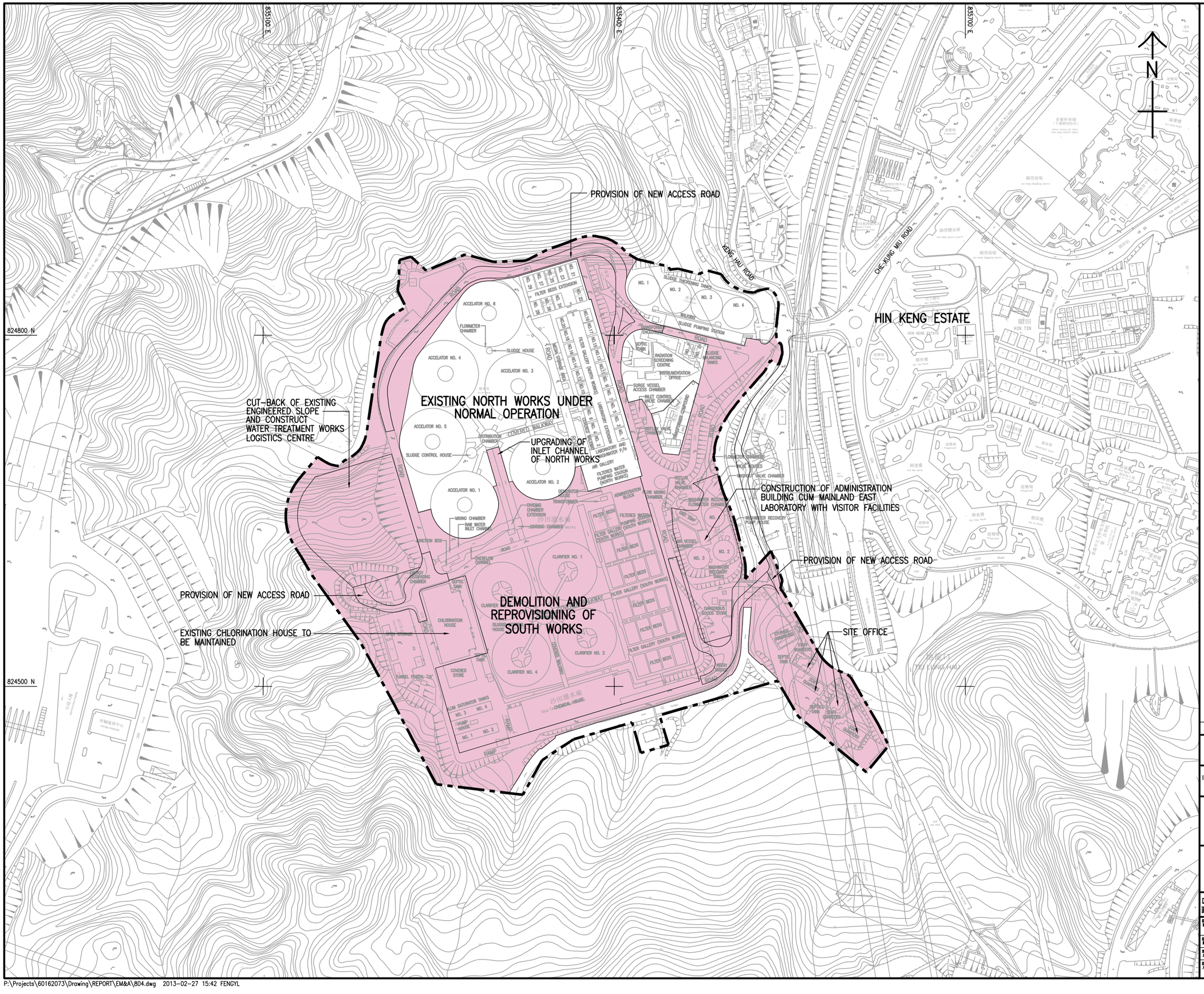
4.1.3 To control the site performance on waste management, the contractor shall ensure that all solid and liquid waste management works are fully in compliance with the relevant license/permit requirements, such as the effluent discharge licence and the chemical waste producer registration. Contractor is also reminded to implement the recommended environmental mitigation measures according to the Environmental Monitoring and Audit Manual.

4.1.4 No environmental complaint were received in the reporting period.

4.1.5 No notification of summons or prosecution was received since commencement of the Contract.

4.1.6 The ET will keep track on the construction works to confirm compliance of environmental requirements and the proper implementation of all necessary mitigation measures.

Appendix A
General Layout Plan



REV. 修訂	DESCRIPTION 內容摘要	D.E. P.E. CHECKED 核准	DATE 日期

水 務 署
WATER SUPPLIES DEPARTMENT

AGREEMENT NO. CE 13/2009 (WS)
IN-SITU REPROVISIONING OF SHA TIN WATER TREATMENT WORKS-SOUTH WORKS
DESIGN AND CONSTRUCTION

LOCATION PLAN AND THE MAJOR SCOPE OF WORKS

AECOM

DRG.NO. 圖紙編號	60162073/EM&A/FIG 1		
DESIGNED BY 設計	–	CONTRACT NO. 合約編號	P. Dy. APPROVED 批准人
DRAWN BY 繪圖	GXH	STATUS 階段	
SCALE 比例	A3 1 : 3000		
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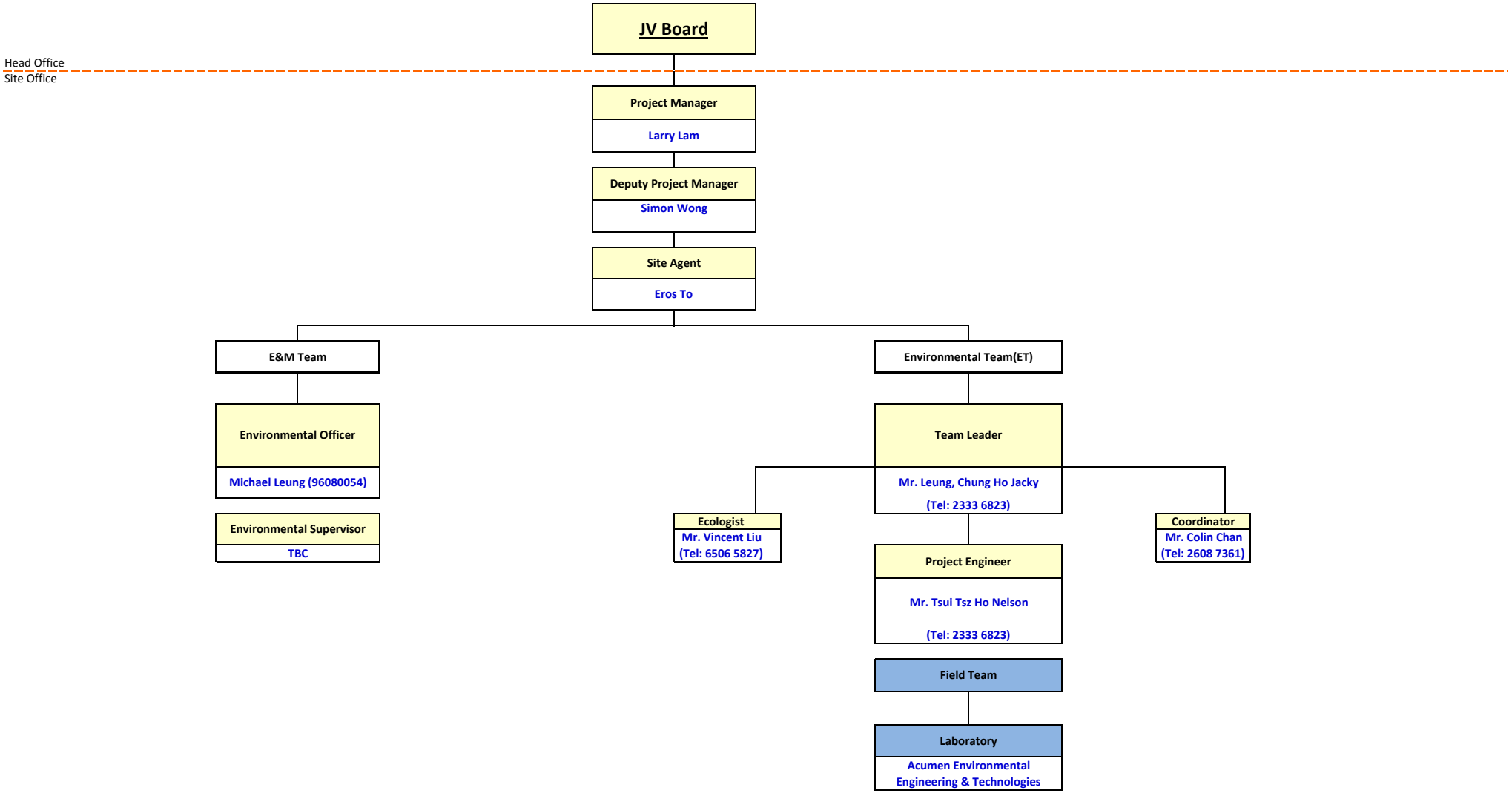
Appendix B
Project Organization

Contract No. 3/WSD/15
In-Situ Reprovisioning of Sha Tin Water Treatment Works (South Works) - Advance Works
Ming Hing - Ming Hing Civil - Vasteam Joint Venture

Update Date 6/11/2017

Project Organization Chart



Appendix C
Latest Construction Programme

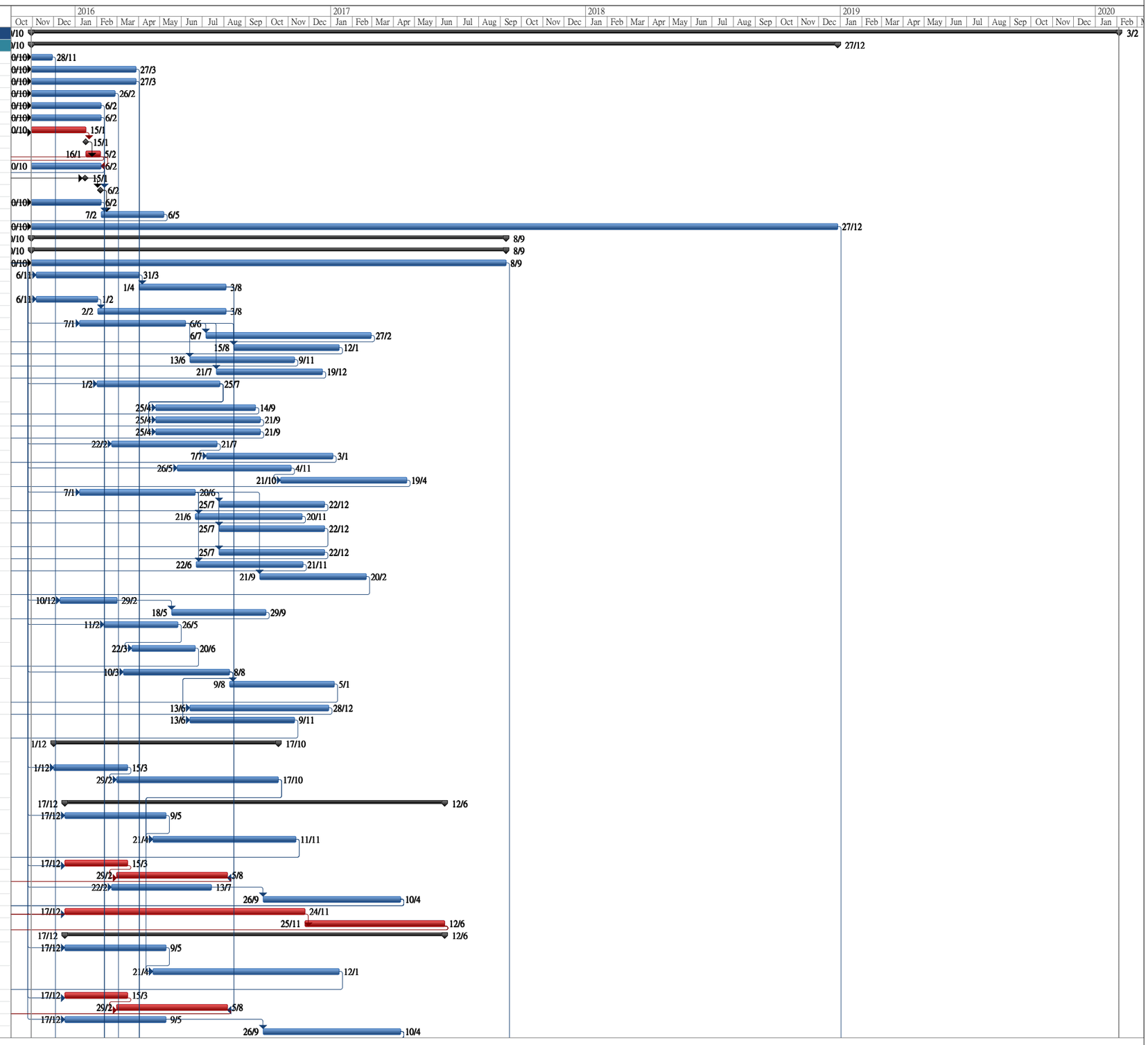
Construction period from 30th October 2015 to 28th October 2019

Contract No.: 3/WSD/15
Title: In-situ Reprovisioning of Sha Tin Water Treatment Works (South Works) - Advance Works

Master Programme (Ver.03)

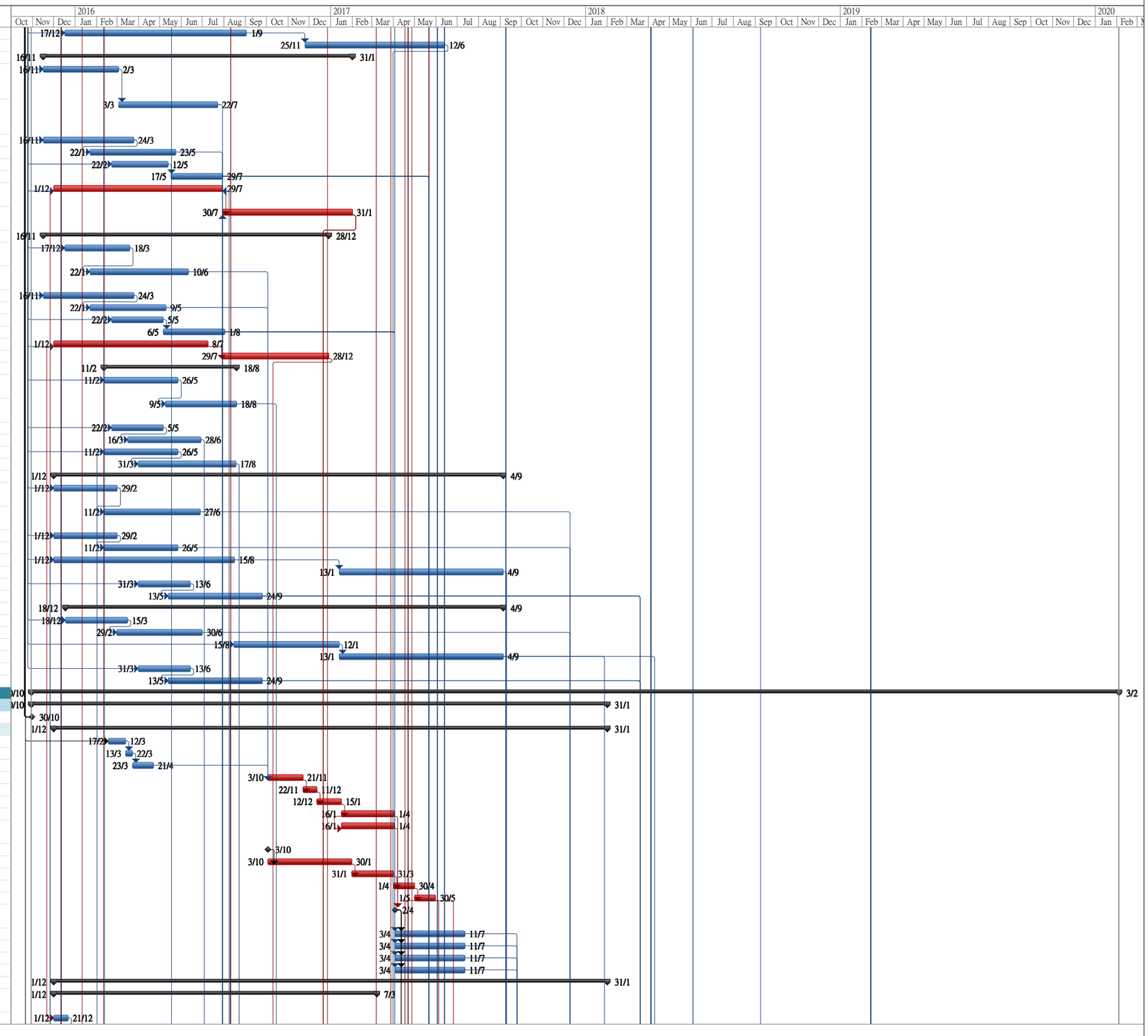
Date: 21 November 2016

ID	ID	Task Name	Duration	Start	Finish
1		**3/WSD/15 Master Programme**	**1558 days**	**Fri 30/10/15**	**Mon 3/2/20**
2	**P000**	**Preliminaries Works**	**1155 days**	**Fri 30/10/15**	**Thu 27/12/18**
3	P001	Temporary RE office	30 days	Fri 30/10/15	Sat 28/11/15
4	P002	Renovation of RE office	150 days	Fri 30/10/15	Sun 27/3/16
5	P003	Erection of site office	150 days	Fri 30/10/15	Sun 27/3/16
6	P004	Wheels wash facilities	120 days	Fri 30/10/15	Fri 26/2/16
7	P005	Initial survey	100 days	Fri 30/10/15	Sat 6/2/16
8	P006	UU detection	100 days	Fri 30/10/15	Sat 6/2/16
9	P007	Tree and vegetation survey	78 days	Fri 30/10/15	Fri 15/1/16
10	P008	Tree and vegetation survey submission to EPD	0 days	Fri 15/1/16	Fri 15/1/16
11	P009	Tree and vegetation survey consent from EPD	21 days	Sat 16/1/16	Fri 5/2/16
12	P010	Environmental Impact baseline monitoring	100 days	Fri 30/10/15	Sat 6/2/16
13	P011	Baseline monitoring submission	0 days	Fri 15/1/16	Fri 15/1/16
14	P012	Baseline monitoring approval	0 days	Sat 6/2/16	Sat 6/2/16
15	P013	Pre-condition survey	100 days	Fri 30/10/15	Sat 6/2/16
16	P014	Tree transplanting works	90 days	Sun 7/2/16	Fri 6/5/16
17	P015	Tree Protection	1155 days	Fri 30/10/15	Thu 27/12/18
18	**D000**	**Contractor's Design Submission**	**680 days**	**Fri 30/10/15**	**Fri 8/9/17**
19	**D100**	**General**	**680 days**	**Fri 30/10/15**	**Fri 8/9/17**
20	D101	Project Design Plan	680 days	Fri 30/10/15	Fri 8/9/17
21	D102	AIP-01 - Addition GI Plan	147 days	Fri 6/11/15	Thu 31/3/16
22	D103	DDA-01 - Geotechnical Assessment if necessary	125 days	Fri 1/4/16	Wed 3/8/16
23	D104	AIP-02 - Basis of Design	88 days	Fri 6/11/15	Mon 1/2/16
24	D105	DDA-02 - Basis of Design if necessary	184 days	Tue 2/2/16	Wed 3/8/16
25	D106	AIP-04 - P&ID	152 days	Thu 7/1/16	Mon 6/6/16
26	D107	DDA-04-1 - P&ID	237 days	Wed 6/7/16	Mon 27/2/17
27	D108	DDA-04-2 - Pumping System & Pipework Design	151 days	Mon 15/8/16	Thu 12/1/17
28	D109	DDA-04-3 - Pipe Support Design	150 days	Mon 13/6/16	Wed 9/11/16
29	D110	DDA-04-4 - Testing & Commissioning	152 days	Thu 21/7/16	Mon 19/12/16
30	D111	AIP-05 - Intrumentation, Control and Automation (DCS / Control Philosophy)	176 days	Mon 1/2/16	Mon 25/7/16
31	D112	DDA-05-1 - DCS (General)	143 days	Mon 25/4/16	Wed 14/9/16
32	D113	DDA-05-2 - DCS (Functional Design Specification)	150 days	Mon 25/4/16	Wed 21/9/16
33	D114	DDA-05-3 - DCS (Control Loop Diagrams)	150 days	Mon 25/4/16	Wed 21/9/16
34	D115	AIP-06 - Communication Network	151 days	Mon 22/2/16	Thu 21/7/16
35	D116	DDA-06 - Communication Network	181 days	Thu 7/7/16	Tue 3/1/17
36	D117	AIP-07 - Automatic Irrigation System	163 days	Thu 26/5/16	Fri 4/11/16
37	D118	DDA-07 - Automatic Irrigation System	181 days	Fri 21/10/16	Wed 19/4/17
38	D119	AIP-08 - Electrical Power Supply System	166 days	Thu 7/1/16	Mon 20/6/16
39	D120	DDA-08-1 - Electrical Power Supply System	151 days	Mon 25/7/16	Thu 22/12/16
40	D121	DDA-08-2 - Earthing Design	153 days	Tue 21/6/16	Sun 20/11/16
41	D122	DDA-08-3 - Fault Calculation & Protection Setting for Electrical System	151 days	Mon 25/7/16	Thu 22/12/16
42	D123	DDA-08-4 - Harmonic Analysis	151 days	Mon 25/7/16	Thu 22/12/16
43	D124	DDA-08-5 - Electrical Typical Design	153 days	Wed 22/6/16	Mon 21/11/16
44	D125	DDA-08-6 - Modification of Existing Administration Building	153 days	Wed 21/9/16	Mon 20/2/17
45	D126	AIP-10A - Process Piping - Civil	82 days	Thu 10/12/15	Mon 29/2/16
46	D127	DDA-10A - Process Piping - Civil	135 days	Wed 18/5/16	Thu 29/9/16
47	D128	AIP-10B - Process Piping - E&M (Pipe Trench E&M Design)	106 days	Thu 11/2/16	Thu 26/5/16
48	D129	DDA-10B - Process Piping - E&M (Pipe Trench E&M Design)	91 days	Tue 22/3/16	Mon 20/6/16
49	D130	AIP-19 - Sitewide E&M Design	152 days	Thu 10/3/16	Mon 8/8/16
50	D131	DDA-19-1 - Sitewide E&M Design (General) (including Cable Duct Routes / Cable Routes)	150 days	Tue 9/8/16	Thu 5/1/17
51	D132	DDA-19-2 - Modification of North Works Air Gallery	199 days	Mon 13/6/16	Wed 28/12/16
52	D133	DDA-19-3 - Process Piping - Modification of North Work Filter and Sludge Handling	150 days	Mon 13/6/16	Wed 9/11/16
53	**D200**	**WTW Logistics Centre, Alum Saturation Tank, and Hydro Turbine House**	**322 days**	**Tue 1/12/15**	**Mon 17/10/16**
54	D201	AIP-11A - Design Concept	106 days	Tue 1/12/15	Tue 15/3/16
55	D202	DDA-11A - Architectural Design Development (DAP stage 2 submission to ASD)	232 days	Mon 29/2/16	Mon 17/10/16
56	**D300**	**WTW Logistics Centre**	**544 days**	**Thu 17/12/15**	**Mon 12/6/17**
57	D301	AIP-12A - Architectural Design including GA, Interior Design and Non-Structural Element	145 days	Thu 17/12/15	Mon 9/5/16
58	D302	DDA-12A - Architectural Design including GA, Interior Design and Non-Structural Element	205 days	Thu 21/4/16	Fri 11/11/16
59	D303	AIP-12B - Foundation & Structural Design	90 days	Thu 17/12/15	Tue 15/3/16
60	D304	DDA-12B - Foundation & Structural Design	159 days	Mon 29/2/16	Fri 5/8/16
61	D305	AIP-12C - Building Services Design	143 days	Mon 22/2/16	Wed 13/7/16
62	D306	DDA-12C - Building Services Design	197 days	Mon 26/9/16	Mon 10/4/17
63	D307	AIP-12D - Electrical & Mechanical Design	344 days	Thu 17/12/15	Thu 24/11/16
64	D308	DDA-12D - Electrical & Mechanical Design	200 days	Fri 25/11/16	Mon 12/6/17
65	**D400**	**Alum Saturation Tanks**	**544 days**	**Thu 17/12/15**	**Mon 12/6/17**
66	D401	AIP-13A - Architectural Design including GA, Interior Design and Non-Structural Element	145 days	Thu 17/12/15	Mon 9/5/16
67	D402	DDA-13A - Architectural Design including GA, Interior Design and Non-Structural Element	267 days	Thu 21/4/16	Thu 12/1/17
68	D403	AIP-13B - Foundation & Structural Design	90 days	Thu 17/12/15	Tue 15/3/16
69	D404	DDA-13B - Foundation & Structural Design	159 days	Mon 29/2/16	Fri 5/8/16
70	D405	AIP-13C - Building Services Design	145 days	Thu 17/12/15	Mon 9/5/16
71	D406	DDA-13C - Building Services Design	197 days	Mon 26/9/16	Mon 10/4/17



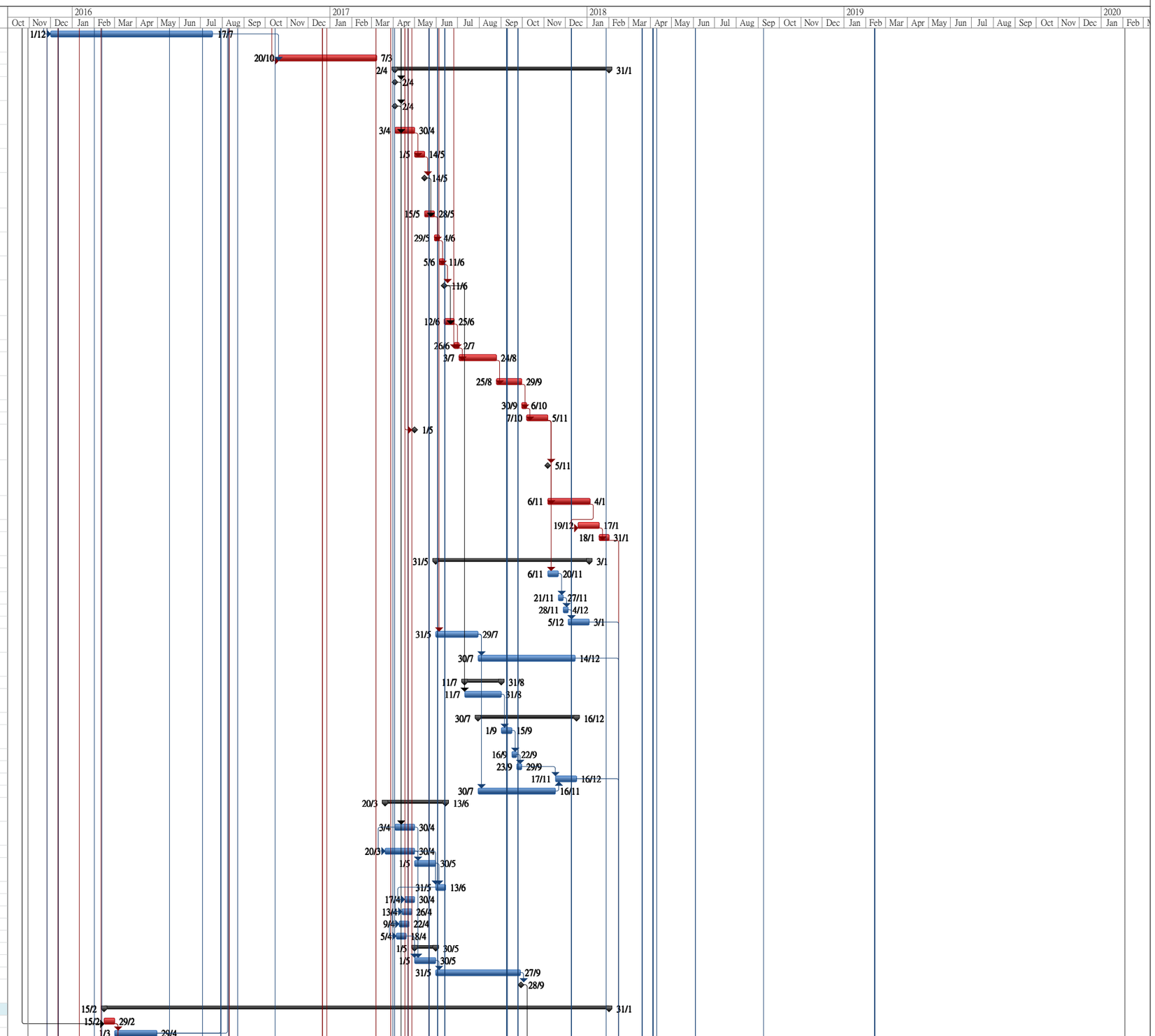
Commencement Date: 30 Oct 2015
Completion Date: 3 Feb 2020
(EOT for Claim no. 009)

ID	ID	Task Name	Duration	Start	Finish
72	D407	AIP-13D - Electrical & Mechanical Design	260 days	Thu 17/12/15	Thu 1/9/16
73	D408	DDA-13D - Electrical & Mechanical Design	200 days	Fri 25/11/16	Mon 12/6/17
74	**D500**	**Hydro Turbine House**	**443 days**	**Mon 16/11/15**	**Tue 31/1/17**
75	D501	AIP-14A - Architectural Design including GA, Interior Design and Non-Structural Element (incl. MEICA and BS design)	108 days	Mon 16/11/15	Wed 2/3/16
76	D502	DDA-14A - Architectural Design including GA, Interior Design and Non-Structural Element (incl. MEICA and BS design)	142 days	Thu 3/3/16	Fri 22/7/16
77	D503	AIP-14B - Foundation & Structural Design	130 days	Mon 16/11/15	Thu 24/3/16
78	D504	DDA-14B - Foundation & Structural Design	123 days	Fri 22/1/16	Mon 23/5/16
79	D505	AIP-14C - Building Services Design	81 days	Mon 22/2/16	Thu 12/5/16
80	D506	DDA-14C - Building Services Design	74 days	Tue 17/5/16	Fri 29/7/16
81	D507	AIP-14D - Electrical & Mechanical Design (incl. Hydraulic study)	242 days	Tue 1/12/15	Fri 29/7/16
82	D508	DDA-14D - Electrical & Mechanical Design (incl. Hydraulic study)	186 days	Sat 30/7/16	Tue 31/1/17
83	**D600**	**North Works Temporary Power House**	**409 days**	**Mon 16/11/15**	**Wed 28/12/16**
84	D601	AIP-15A - Architectural Design including GA, Interior Design and Non-Structural Element	93 days	Thu 17/12/15	Fri 18/3/16
85	D602	DDA-15A - Architectural Design including GA, Interior Design and Non-Structural Element	141 days	Fri 22/1/16	Fri 10/6/16
86	D603	AIP-15B - Foundation & Structural Design	130 days	Mon 16/11/15	Thu 24/3/16
87	D604	DDA-15B - Foundation & Structural Design	109 days	Fri 22/1/16	Mon 9/5/16
88	D605	AIP-15C - Building Services Design	74 days	Mon 22/2/16	Thu 5/5/16
89	D606	DDA-15C - Building Services Design	88 days	Fri 6/5/16	Mon 1/8/16
90	D607	AIP-15D - Electrical & Mechanical Design	221 days	Tue 1/12/15	Fri 8/7/16
91	D608	DDA-15D - Electrical & Mechanical Design	153 days	Fri 29/7/16	Wed 28/12/16
92	**D700**	**Temporary Washwater Recovery Tank**	**190 days**	**Thu 11/2/16**	**Thu 18/8/16**
93	D701	AIP-16A - Galvanized Steel Platforms, Walkways and Footing Design	106 days	Thu 11/2/16	Thu 26/5/16
94	D702	DDA-16A - Galvanized Steel Platforms, Walkways and Footing Design	102 days	Mon 9/5/16	Thu 18/8/16
95	D703	AIP-16B - Lighting Design	74 days	Mon 22/2/16	Thu 5/5/16
96	D704	DDA-16B - Lighting Design	105 days	Wed 16/3/16	Tue 28/6/16
97	D705	AIP-16C - Electrical & Mechanical Design	106 days	Thu 11/2/16	Thu 26/5/16
98	D706	DDA-16C - Electrical & Mechanical Design	140 days	Thu 31/3/16	Wed 17/8/16
99	**D800**	**Flowmeter House**	**644 days**	**Tue 1/12/15**	**Mon 4/9/17**
100	D801	AIP-17A - Architectural Design including GA, Interior Design and Non-Structural Element	91 days	Tue 1/12/15	Mon 29/2/16
101	D802	DDA-17A - Architectural Design including GA, Interior Design and Non-Structural Element	138 days	Thu 11/2/16	Mon 27/6/16
102	D803	AIP-17B - Foundation & Structural Design	91 days	Tue 1/12/15	Mon 29/2/16
103	D804	DDA-17B - Foundation & Structural Design	106 days	Thu 11/2/16	Thu 26/5/16
104	D805	AIP-17C - Electrical & Mechanical Design	259 days	Tue 1/12/15	Mon 15/8/16
105	D806	DDA-17C - Electrical & Mechanical Design	235 days	Fri 13/1/17	Mon 4/9/17
106	D807	AIP-17D - Building Services Design	75 days	Thu 31/3/16	Mon 13/6/16
107	D808	DDA-17D - Building Services Designn	135 days	Fri 13/5/16	Sat 24/9/16
108	**D900**	**Valve Chamber**	**627 days**	**Fri 18/12/15**	**Mon 4/9/17**
109	D901	AIP-18A - Foundation, Civil & Structural Design	89 days	Fri 18/12/15	Tue 15/3/16
110	D902	DDA-18A - Foundation, Civil & Structural Design	123 days	Mon 29/2/16	Thu 30/6/16
111	D903	AIP-18B - Electrical & Mechanical Design	151 days	Mon 15/8/16	Thu 12/1/17
112	D904	DDA-18B - Electrical & Mechanical Design	235 days	Fri 13/1/17	Mon 4/9/17
113	D905	AIP-18C - Building Services Design	75 days	Thu 31/3/16	Mon 13/6/16
114	D906	DDA-18C - Building Services Design	135 days	Fri 13/5/16	Sat 24/9/16
115	**S0000**	**Section Programme**	**1558 days**	**Fri 30/10/15**	**Mon 3/2/20**
116	**S1000**	**Section 1**	**825 days**	**Fri 30/10/15**	**Wed 31/1/18**
117	**S1001**	**Section 1 Commencement**	**1 day**	**Fri 30/10/15**	**Fri 30/10/15**
118	**S1100**	**North Works Temporary Power House**	**793 days**	**Tue 1/12/15**	**Wed 31/1/18**
119	S1101	Excavation of trial pit for earthing test	25 days	Wed 17/2/16	Sat 12/3/16
120	S1102	Ground Investigation Wroks	10 days	Sun 13/3/16	Tue 22/3/16
121	S1103	Additational drilling for in planting earthing log	30 days	Wed 23/3/16	Thu 21/4/16
122	S1104	Excavation and installation of ELS	50 days	Mon 3/10/16	Mon 21/11/16
123	S1105	Installation of earth mat	20 days	Tue 22/11/16	Sun 11/12/16
124	S1106	Foundation	35 days	Mon 12/12/16	Sun 15/1/17
125	S1107	Structural for North Works Tempoary Power House	76 days	Mon 16/1/17	Sat 1/4/17
126	S1108	Laying of cable ducts, construction of draw pits and installation of cable trays	76 days	Mon 16/1/17	Sat 1/4/17
127	S1109	Confirmation of cable routing with CLP and WSD	0 days	Mon 3/10/16	Mon 3/10/16
128	S1110	Design 6.6kv / 11kv working platform	120 days	Mon 3/10/16	Mon 30/1/17
129	S1111	Construction of 6.6kv / 11kv working platform	60 days	Tue 31/1/17	Fri 31/3/17
130	S1112	Cable tray construction	30 days	Sat 1/4/17	Sun 30/4/17
131	S1113	Laying 6.6kv / 11 kv cable by CLP	30 days	Mon 1/5/17	Tue 30/5/17
132	S1114	Completion of concrete structure of North Works Temporary Power House	1 day	Sun 2/4/17	Sun 2/4/17
133	S1115	Plumbing and Drainage installation	100 days	Mon 3/4/17	Tue 11/7/17
134	S1116	MVAC installation	100 days	Mon 3/4/17	Tue 11/7/17
135	S1117	Fire Services installation	100 days	Mon 3/4/17	Tue 11/7/17
136	S1118	Electrical installation	100 days	Mon 3/4/17	Tue 11/7/17
137	**S1119**	**Section 1 Site Works For E & M Works**	**793 days**	**Tue 1/12/15**	**Wed 31/1/18**
138	**S1120**	**North Works Temporary Power House_NWTPH**	**463 days**	**Tue 1/12/15**	**Tue 7/3/17**
139	S1121	NWTPH- Electrical Equipment Procurement	21 days	Tue 1/12/15	Mon 21/12/15



Critical Split | Task | Milestone | Summary | Manual Summary | Critical

ID	ID	Task Name	Duration	Start	Finish
140	S1122	NWTPH- Electrical Equipment Manufacturing & FAT	230 days	Tue 1/12/15	Sun 17/7/16
141	S1123	NWTPH- Electrical Equipment Delivery	139 days	Thu 20/10/16	Tue 7/3/17
142	**S1124**	**NWTPH Phase 1 - E & M Works**	**304 days**	**Sun 2/4/17**	**Wed 31/1/18**
143	S1125	NWTPH- Superstructure & ABWF (up to R/F slab) - H/O by Civil Contractor	0 days	Sun 2/4/17	Sun 2/4/17
144	S1126	NWTPH- LV Supply Installation Commence at G/F	0 days	Sun 2/4/17	Sun 2/4/17
145	S1127	NWTPH- 6.6KV/11kv Switchboard Installation at 1/F (incl. T & C)	28 days	Mon 3/4/17	Sun 30/4/17
146	S1128	NWTPH- Installation of 5 nos. of New Cap Bank for Pumps at 1/F	14 days	Mon 1/5/17	Sun 14/5/17
147	S1129	NWTPH- New ducts, Draw pits & Openings for 6.6kV (Phase 1) Source 2 CLP Diversion - H/O by Civil Contractor	0 days	Sun 14/5/17	Sun 14/5/17
148	S1130	NWTPH- CLP Inspection of the New ducts, Draw pits & Openings for 6.6kV	14 days	Mon 15/5/17	Sun 28/5/17
149	S1131	NWTPH- Defect Rectify after CLP Inspection of the New ducts, Draw pits & Openings	7 days	Mon 29/5/17	Sun 4/6/17
150	S1132	NWTPH- Second CLP Inspection of the rectified New ducts, Draw pits & Openings	7 days	Mon 5/6/17	Sun 11/6/17
151	S1133	NWTPH- T07 New Ducts/Pits/Openings after defect rectification to CLP - H/O by Civil Contractor	0 days	Sun 11/6/17	Sun 11/6/17
152	S1134	NWTPH- CLP Mobilization for Supply 2 diversion	14 days	Mon 12/6/17	Sun 25/6/17
153	S1135	NWTPH- CLP T&C of the completed HV cables	7 days	Mon 26/6/17	Sun 2/7/17
154	S1136	NWTPH- Liaison with WSD for pump no.12 new power connection	53 days	Mon 3/7/17	Thu 24/8/17
155	S1137	NWTPH- Connection of new power supply to Pump No.12	36 days	Fri 25/8/17	Fri 29/9/17
156	S1138	NWTPH- 6.6KV Switchboard T&C incl. CLP	7 days	Sat 30/9/17	Fri 6/10/17
157	S1139	NWTPH- 6.6KV Switchboard Energisation	30 days	Sat 7/10/17	Sun 5/11/17
158	S1140	NWTPH- New ducts, Draw pits & Openings for Reroute cable from 6.6 KVSB 3 to 6.6 KVSB - H/O by Civil Contractor	0 days	Mon 1/5/17	Mon 1/5/17
159	S1141	NWTPH- T06 New ducts & draw pits between Filters & Sludge treatment plant - H/O by Civil Contractor	0 days	Sun 5/11/17	Sun 5/11/17
160	S1142	NWTPH- Diversion of load from Existing LV SwitchRoom	60 days	Mon 6/11/17	Thu 4/1/18
161	S1143	NWTPH- Tx 3 relocate to STP & replace Tx 4	30 days	Tue 19/12/17	Wed 17/1/18
162	S1144	NWTPH- Reroute Tx cable from 6.6 KVSB 3 to 6.6 KVSB	14 days	Thu 18/1/18	Wed 31/1/18
163	**S1145**	**NWTPH Phase 2 - E&M Works**	**218 days**	**Wed 31/5/17**	**Wed 3/1/18**
164	S1146	NWTPH- CLP Mobilization for Supply 3 diversion	15 days	Mon 6/11/17	Mon 20/11/17
165	S1147	NWTPH-CLP T&C of the completed HV cables	7 days	Tue 21/11/17	Mon 27/11/17
166	S1148	NWTPH-6.6KV Switchboard T&C incl. CLP	7 days	Tue 28/11/17	Mon 4/12/17
167	S1149	NWTPH-6.6KV Switchboard Energisation	30 days	Tue 5/12/17	Wed 3/1/18
168	S1150	NWTPH-Liaison with WSD for pump No.9,10,11,13,14 for connection to new supply	60 days	Wed 31/5/17	Sat 29/7/17
169	S1151	NWTPH-T&C incl. the remaining 5 sets of 6.6KV HV Pump	138 days	Sun 30/7/17	Thu 14/12/17
170	**S1152**	**NWTPH Phase 3 - E&M Works**	**52 days**	**Tue 11/7/17**	**Thu 31/8/17**
171	S1153	NWTPH-6.6KV Supply Installation Interconnection Cable Diversion	52 days	Tue 11/7/17	Thu 31/8/17
172	**S1154**	**NWTPH Phase 4 - E&M Works**	**140 days**	**Sun 30/7/17**	**Sat 16/12/17**
173	S1155	NWTPH-CLP Mobilization for Supply 4 diversion	15 days	Fri 1/9/17	Fri 15/9/17
174	S1156	NWTPH-CLP T&C of the completed HV cables	7 days	Sat 16/9/17	Fri 22/9/17
175	S1157	NWTPH-6.6KV Switchboard T&C incl. CLP	7 days	Sat 23/9/17	Fri 29/9/17
176	S1158	NWTPH-6.6KV Switchboard Energisation	30 days	Fri 17/11/17	Sat 16/12/17
177	S1159	Relocation of existig 6.6kv capacitor banks	110 days	Sun 30/7/17	Thu 16/11/17
178	**S1160**	**NWTPH LVSB, Tx, PLC & Genset Installation at G/F**	**86 days**	**Mon 20/3/17**	**Tue 13/6/17**
179	S1161	NWTPH-6.6KV/11KV to 380V Transformers Tx	28 days	Mon 3/4/17	Sun 30/4/17
180	S1162	NWTPH-300KVA ESS. Genset	42 days	Mon 20/3/17	Sun 30/4/17
181	S1163	NWTPH- PLC & Ctrl. (incl. 6.6kV switchboard to existing Admin. Building)	30 days	Mon 1/5/17	Tue 30/5/17
182	S1164	NWTPH- Battery Room	14 days	Wed 31/5/17	Tue 13/6/17
183	S1165	NWTPH- Cable Supports	14 days	Mon 17/4/17	Sun 30/4/17
184	S1166	NWTPH- Cable Trays	14 days	Thu 13/4/17	Wed 26/4/17
185	S1167	NWTPH- Cable Laying	14 days	Sun 9/4/17	Sat 22/4/17
186	S1168	NWTPH- Cable Termination	14 days	Wed 5/4/17	Tue 18/4/17
187	**S1169**	**NWTPH - T&C NWTPH - T&C**	**30 days**	**Mon 1/5/17**	**Tue 30/5/17**
188	S1170	NWTPH- Testing	30 days	Mon 1/5/17	Tue 30/5/17
189	S1171	Finishing works	120 days	Wed 31/5/17	Wed 27/9/17
190	S1172	Completion of architectural finishes and relevant works (both internal and external)	1 day	Thu 28/9/17	Thu 28/9/17
191	**S1200**	**Hydro Turbine House**	**717 days**	**Mon 15/2/16**	**Wed 31/1/18**
192	S1201	Site survey of existing pipeworks and cabling	15 days	Mon 15/2/16	Mon 29/2/16
193	S1202	Data collection for HTH design by Atal	60 days	Tue 1/3/16	Fri 29/4/16



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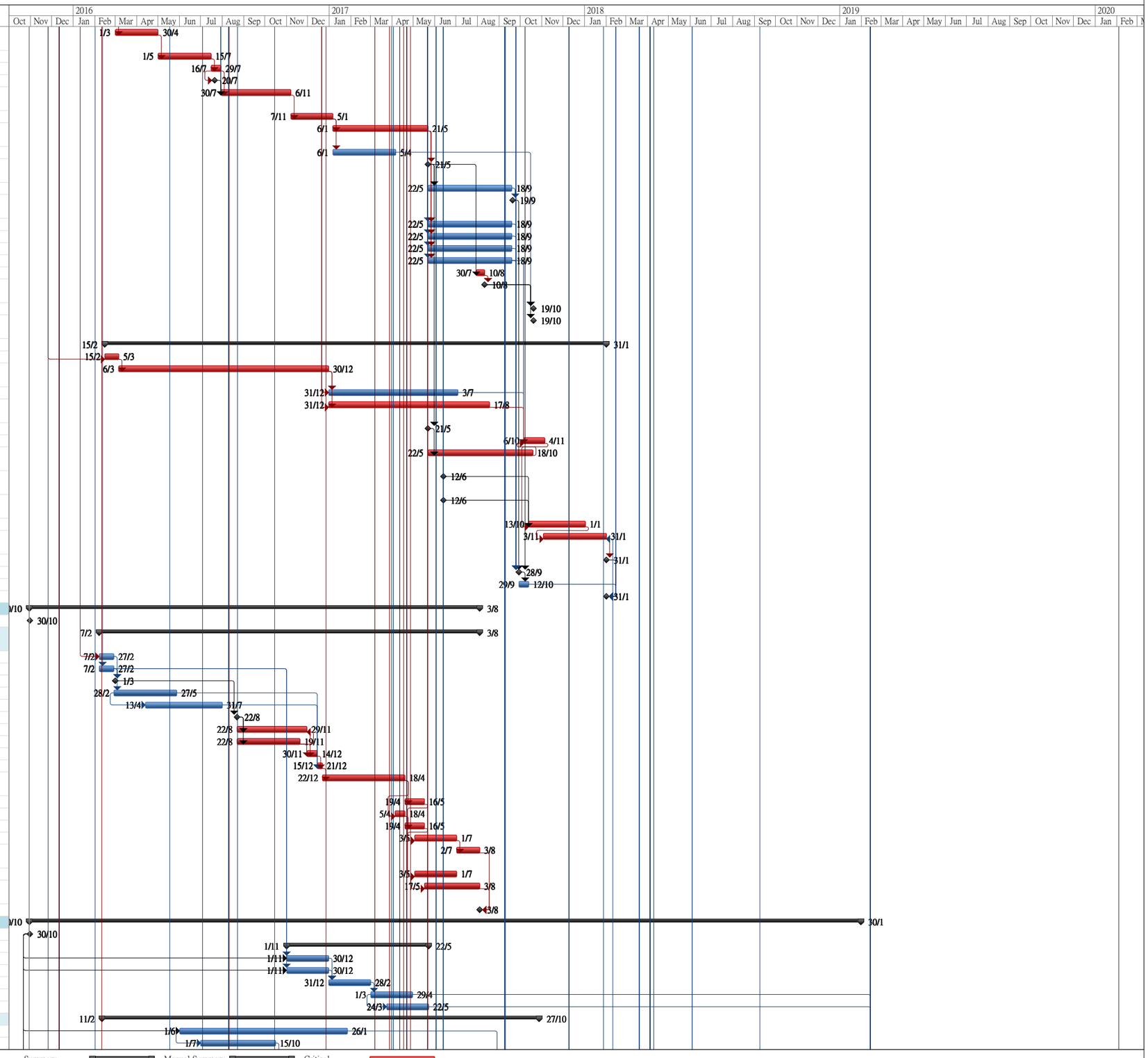
ID	ID	Task Name	Duration	Start	Finish
194	S1203	Construction of cable ducting for signal and power cable	61 days	Tue 1/3/16	Sat 30/4/16
195	S1204	Relocation of sampling panel and cable diversion	76 days	Sun 1/5/16	Fri 15/7/16
196	S1205	Water suspension of High Island Water main pipes	14 days	Sat 16/7/16	Fri 29/7/16
197	S1206	Capping of path A	0 days	Wed 20/7/16	Wed 20/7/16
198	S1207	ELS works and demolition of EDH (incl. relocation of existing E & M equipment)	100 days	Sat 30/7/16	Sun 6/11/16
199	S1208	Foundation	60 days	Mon 7/11/16	Thu 5/1/17
200	S1209	Superstructure for Hydro Turbine House (incl. backfilling)	136 days	Fri 6/1/17	Sun 21/5/17
201	S1210	Installation of I/O pipes outside HTH	90 days	Fri 6/1/17	Wed 5/4/17
202	S1211	Completion of concrete structure of Hydro Turbine House	0 days	Sun 21/5/17	Sun 21/5/17
203	S1212	Finishing works	120 days	Mon 22/5/17	Mon 18/9/17
204	S1213	Completion of architectural finishes and relevant works (both internal and external)	1 day	Tue 19/9/17	Tue 19/9/17
205	S1214	Plumbing and Drainage installation	120 days	Mon 22/5/17	Mon 18/9/17
206	S1215	MVAC installation	120 days	Mon 22/5/17	Mon 18/9/17
207	S1216	Fire Services installation	120 days	Mon 22/5/17	Mon 18/9/17
208	S1217	Electrical installation	120 days	Mon 22/5/17	Mon 18/9/17
209	S1218	Water suspension of High Island Water main pipes	12 days	Sun 30/7/17	Thu 10/8/17
210	S1219	Re-arrangement of Raw Water path B to original Path A from High Island Reservoir	0 days	Thu 10/8/17	Thu 10/8/17
211	S1220	Connecting HTH outlet pipe to original path B	0 days	Thu 19/10/17	Thu 19/10/17
212	S1221	Remove capping of path A and reinstall flow meter at HF1	0 days	Thu 19/10/17	Thu 19/10/17
213	**S1222**	**Hydro Turbine House - E&M Works (Section 1)**	**717 days**	**Mon 15/2/16**	**Wed 31/1/18**
214	S1223	Hydro Turbine House - E&M Equipment Procurement	20 days	Mon 15/2/16	Sat 5/3/16
215	S1224	Hydro Turbine House - E&M Equipment Manufacturing & FAT	300 days	Sun 6/3/16	Fri 30/12/16
216	S1225	Hydro Turbine House - E&M Equipment Delivery	185 days	Sat 31/12/16	Mon 3/7/17
217	S1226	Hydro Turbine House - E&M Equipment Delivery (Needle Valve & Turbine Generator)	230 days	Sat 31/12/16	Thu 17/8/17
218	S1227	Hydro Turbine House - H/O by Civil Contractor	0 days	Sun 21/5/17	Sun 21/5/17
219	S1228	Installation of needle valve and turbine genertor	30 days	Fri 6/10/17	Sat 4/11/17
220	S1229	Hydro Turbine House - Hydropower Generation System Mechanical Installation	150 days	Mon 22/5/17	Wed 18/10/17
221	S1230	T04 - Trench/Cable ducts & Draw Pits H/O by Civil Contractor	0 days	Mon 12/6/17	Mon 12/6/17
222	S1231	T05 - Trench/Cable ducts & Draw Pits H/O by Civil Contractor	0 days	Mon 12/6/17	Mon 12/6/17
223	S1232	Hydro Turbine House - Electrical & ICA Installation	81 days	Fri 13/10/17	Mon 1/1/18
224	S1233	Hydro Turbine House - CLP Inspection & acceptance (Driven by Logistics house DCS)	90 days	Fri 3/11/17	Wed 31/1/18
225	S1234	Hydro Turbine House - T&C	30 days	Tue 2/1/18	Wed 31/1/18
226	S1235	FSD inspection	0 days	Thu 28/9/17	Thu 28/9/17
227	S1236	Rectification of defects and issue of certificate	14 days	Fri 29/9/17	Thu 12/10/17
228	**S1237**	**Section 1 Completion**	**1 day**	**Wed 31/1/18**	**Wed 31/1/18**
229	**S2000**	**Section 2**	**644 days**	**Fri 30/10/15**	**Thu 3/8/17**
230	**S2001**	**Section 2 Commencement**	**1 day**	**Fri 30/10/15**	**Fri 30/10/15**
231	**S2100**	**Site Formation and Slope Retaining Structures for North Circular Road**	**544 days**	**Sun 7/2/16**	**Thu 3/8/17**
232	S2101	Site Clearance	21 days	Sun 7/2/16	Sat 27/2/16
233	S2102	Temporary works removal Utilities relocation	21 days	Sun 7/2/16	Sat 27/2/16
234	S2103	Submission of DI 1038	0 days	Tue 1/3/16	Tue 1/3/16
235	S2104	Excavation for L-shape Retaining wall	90 days	Sun 28/2/16	Fri 27/5/16
236	S2105	Construction of L-shape Retaining wall	110 days	Wed 13/4/16	Sun 31/7/16
237	S2106	Permission of DI 1038	0 days	Mon 22/8/16	Mon 22/8/16
238	S2107	Excavation and backfilling for bore piling works area	100 days	Mon 22/8/16	Tue 29/11/16
239	S2108	Installation of temp. soil nail	90 days	Mon 22/8/16	Sat 19/11/16
240	S2109	GI works for bored piles and mini piles	15 days	Wed 30/11/16	Wed 14/12/16
241	S2110	Bored piling machine establishment	7 days	Thu 15/12/16	Wed 21/12/16
242	S2111	Construction of bored piles (D) (H 5-10m, L 70m, Dia 1.5m)	118 days	Thu 22/12/16	Tue 18/4/17
243	S2112	Bored Pile test	28 days	Wed 19/4/17	Tue 16/5/17
244	S2113	Excavation for mini pile area	14 days	Wed 5/4/17	Tue 18/4/17
245	S2114	Mini pile load test	28 days	Wed 19/4/17	Tue 16/5/17
246	S2115	Construction of mini piles	60 days	Wed 3/5/17	Sat 1/7/17
247	S2116	Construction of mini piles cap and L-shape retaining wall	33 days	Sun 2/7/17	Thu 3/8/17
248	S2117	Construction of retaining wall above bored pile	60 days	Wed 3/5/17	Sat 1/7/17
249	S2118	Construction of R-wall above ground concurrent with backfilling works	79 days	Wed 17/5/17	Thu 3/8/17
250	**S2002**	**Section 2 Completion**	**1 day**	**Thu 3/8/17**	**Thu 3/8/17**
251	**S3000**	**Section 3**	**1189 days**	**Fri 30/10/15**	**Wed 30/1/19**
252	**S3001**	**Section 3 Commencement**	**1 day**	**Fri 30/10/15**	**Fri 30/10/15**
253	**S3003**	**North Circular New Road**	**203 days**	**Tue 1/11/16**	**Mon 22/5/17**
254	S3004	Raising the existing Flowmeter chamber	60 days	Tue 1/11/16	Fri 30/12/16
255	S3005	Excavation for construction of new valve chamber	60 days	Tue 1/11/16	Fri 30/12/16
256	S3006	Construction of new valve chamber	60 days	Sat 31/12/16	Tue 28/2/17
257	S3007	Construction for new road and drainage	60 days	Wed 1/3/17	Sat 29/4/17
258	S3008	BS works (lighting)	60 days	Fri 24/3/17	Mon 22/5/17
259	**S3009**	**Temporary Washwater Recovery Tank**	**625 days**	**Thu 11/2/16**	**Fri 27/10/17**
260	S3010	Construction of DN900 Washwater pipes	240 days	Wed 1/6/16	Thu 26/1/17
261	S3011	Construction of Wier Walls	107 days	Fri 1/7/16	Sat 15/10/16



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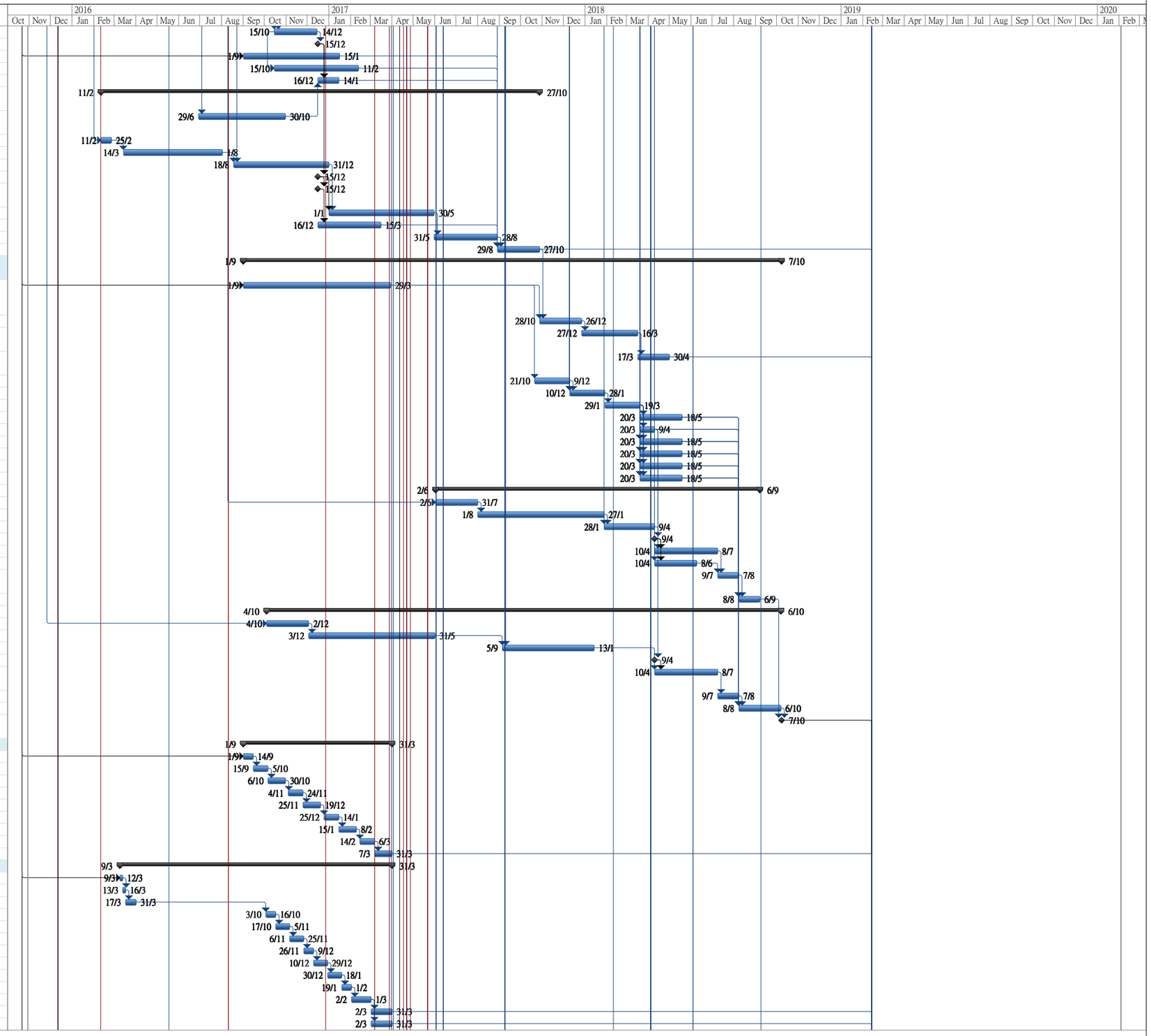
ID	ID	Task Name	Duration	Start	Finish
262	S3012	Construction of Steel Bridge & Decking	61 days	Sat 15/10/16	Wed 14/12/16
263	S3013	Completion of steel platforms and walkway installation	1 day	Thu 15/12/16	Thu 15/12/16
264	S3014	Lay 400mm & 100mm pipes	137 days	Thu 1/9/16	Sun 15/1/17
265	S3015	External Process Pipe Line installation	120 days	Sat 15/10/16	Sat 11/2/17
266	S3016	Electrical installation (Lighting)	30 days	Fri 16/12/16	Sat 14/1/17
267	**S3017**	**Temporary Washwater Recovery Tank - E&M Works**	**625 days**	**Thu 11/2/16**	**Fri 27/10/17**
268	S3018	E&M equipment procurement and Completion of delivery of E&M equipment on site (Lighting)	124 days	Wed 29/6/16	Sun 30/10/16
269	S3019	Temp. WRT - Equipment Procurement	15 days	Thu 11/2/16	Thu 25/2/16
270	S3020	Temp. WRT - Equipment Manufacturing & FAT	141 days	Mon 14/3/16	Mon 1/8/16
271	S3021	Temp. WRT - Equipment Delivery	136 days	Thu 18/8/16	Sat 31/12/16
272	S3022	Temp. WRT - H/O by Civil Contractor	0 days	Thu 15/12/16	Thu 15/12/16
273	S3023	Temp. WRT - T01 LV/Fibre Cable draw pit & trench H/O by Civil Contractor	0 days	Thu 15/12/16	Thu 15/12/16
274	S3024	Temp. WRT - E&M Installation	150 days	Sun 1/1/17	Tue 30/5/17
275	S3025	Temp. WRT - Process pipelines installation	90 days	Fri 16/12/16	Wed 15/3/17
276	S3026	Temp. WRT - ICA	90 days	Wed 31/5/17	Mon 28/8/17
277	S3027	Temp. WRT - T&C	60 days	Tue 29/8/17	Fri 27/10/17
278	**S3300**	**Administration Building Site Formation + Flow Meter House + Valve Chamber**	**767 days**	**Thu 1/9/16**	**Sun 7/10/18**
279	S3301	Planning & coordination with WSD for re-arrangement of raw watermains from High Island Reservoir and construction of Flowmeter House and Valve Chamber	210 days	Thu 1/9/16	Wed 29/3/17
280	S3302	Removal of existing utitities	60 days	Sat 28/10/17	Tue 26/12/17
281	S3303	Demolishing existing structure for future adminstration Building	80 days	Wed 27/12/17	Fri 16/3/18
282	S3304	Site formation (Backfilling) for future adminstration building	45 days	Sat 17/3/18	Mon 30/4/18
283	S3305	Removal of existing Flow meter and Valve Chambers	50 days	Sat 21/10/17	Sat 9/12/17
284	S3306	Excavation for Flow meter house and Valve chambers	50 days	Sun 10/12/17	Sun 28/1/18
285	S3307	Construction of Flow meter house and Valve chamber	50 days	Mon 29/1/18	Mon 19/3/18
286	S3308	Finishing Works	60 days	Tue 20/3/18	Fri 18/5/18
287	S3309	Relocating existing Flow Meter and Valve	21 days	Tue 20/3/18	Mon 9/4/18
288	S3310	Plumbing and Drainage installation	60 days	Tue 20/3/18	Fri 18/5/18
289	S3311	MVAC installation	60 days	Tue 20/3/18	Fri 18/5/18
290	S3312	Fire Services installation	60 days	Tue 20/3/18	Fri 18/5/18
291	S3313	Electrical installation	60 days	Tue 20/3/18	Fri 18/5/18
292	**S3314**	**Valve Chamber - E&M Works**	**462 days**	**Fri 2/6/17**	**Thu 6/9/18**
293	S3315	Valve Chamber - Equipment Procurement	60 days	Fri 2/6/17	Mon 31/7/17
294	S3316	Valve Chamber - Equipment Manufacturing & FAT	180 days	Tue 1/8/17	Sat 27/1/18
295	S3317	Valve Chamber - Equipment Delivery	72 days	Sun 28/1/18	Mon 9/4/18
296	S3318	Valve Chamber - H/O by Civil Contractor	0 days	Mon 9/4/18	Mon 9/4/18
297	S3319	Valve Chamber - Equipment Site Works Duration*	90 days	Tue 10/4/18	Sun 8/7/18
298	S3320	Valve Chamber - E&M Installation	60 days	Tue 10/4/18	Fri 8/6/18
299	S3321	Valve Chamber - Modifying the actuator to suit new level	30 days	Mon 9/7/18	Tue 7/8/18
300	S3322	Valve Chamber - T&C	30 days	Wed 8/8/18	Thu 6/9/18
301	**S3323**	**Flowmeter House - E&M Works**	**733 days**	**Tue 4/10/16**	**Sat 6/10/18**
302	S3324	Flowmeter House - Equipment Procurement	60 days	Tue 4/10/16	Fri 2/12/16
303	S3325	Flowmeter House - Equipment Manufacturing & FAT	180 days	Sat 3/12/16	Wed 31/5/17
304	S3326	Flowmeter House - Equipment Delivery	131 days	Tue 5/9/17	Sat 13/1/18
305	S3327	Flowmeter House - H/O by Civil Contractor	0 days	Mon 9/4/18	Mon 9/4/18
306	S3328	Flowmeter House - E&M Installation of new mono rails & reocate flowmeter	90 days	Tue 10/4/18	Sun 8/7/18
307	S3329	Flowmeter House - Power Supply	30 days	Mon 9/7/18	Tue 7/8/18
308	S3330	Flowmeter House - T&C	60 days	Wed 8/8/18	Sat 6/10/18
309	S3331	Completion of architectural finishes and relevant works (both internal and external)	1 day	Sun 7/10/18	Sun 7/10/18
310	**S3400**	**Box Culvert at Tin Sum Nullah**	**212 days**	**Thu 1/9/16**	**Fri 31/3/17**
311	S3401	Excavation for temp water diversion	14 days	Thu 1/9/16	Wed 14/9/16
312	S3402	Excavation for Box culvert (Section 1)	21 days	Thu 15/9/16	Wed 5/10/16
313	S3403	Construction for Box Culvert (Section 1)	25 days	Thu 6/10/16	Sun 30/10/16
314	S3404	Excavation for Box culvert (Section 2)	21 days	Fri 4/11/16	Thu 24/11/16
315	S3405	Construction for Box Culvert (Section 2)	25 days	Fri 25/11/16	Mon 19/12/16
316	S3406	Excavation for Box culvert (Section 3)	21 days	Sun 25/12/16	Sat 14/1/17
317	S3407	Construction for Box Culvert (Section 3)	25 days	Sun 15/1/17	Wed 8/2/17
318	S3408	Excavation for Box culvert (Section 4)	21 days	Tue 14/2/17	Mon 6/3/17
319	S3409	Construction for Box Culvert (Section 4)	25 days	Tue 7/3/17	Fri 31/3/17
320	**S3500**	**Storm Drain for Decking at Tin Sum Nullah**	**388 days**	**Wed 9/3/16**	**Fri 31/3/17**
321	S3501	Temporary water diversion	4 days	Wed 9/3/16	Sat 12/3/16
322	S3502	Construction for Storm drain (Section 1)	4 days	Sun 13/3/16	Wed 16/3/16
323	S3503	Installation for Storm Drain	15 days	Thu 17/3/16	Thu 31/3/16
324	S3504	Temporary water diversion	14 days	Mon 3/10/16	Sun 16/10/16
325	S3505	Excavation for Storm drain (Section 2)	20 days	Mon 17/10/16	Sat 5/11/16
326	S3506	Installation for Storm Drain	20 days	Sun 6/11/16	Fri 25/11/16
327	S3507	Temporary water diversion	14 days	Sat 26/11/16	Fri 9/12/16
328	S3508	Excavation for Storm drain (Section 3)	20 days	Sat 10/12/16	Thu 29/12/16
329	S3509	Installation for Storm Drain	20 days	Fri 30/12/16	Wed 18/1/17
330	S3510	Inlet, CP and bendblock construction	14 days	Thu 19/1/17	Wed 1/2/17
331	S3511	Backfilling	28 days	Thu 2/2/17	Wed 1/3/17
332	S3512	Modification of STWTW main entrance	30 days	Thu 2/3/17	Fri 31/3/17
333	S3513	Construction of temp. flow meter house	30 days	Thu 2/3/17	Fri 31/3/17



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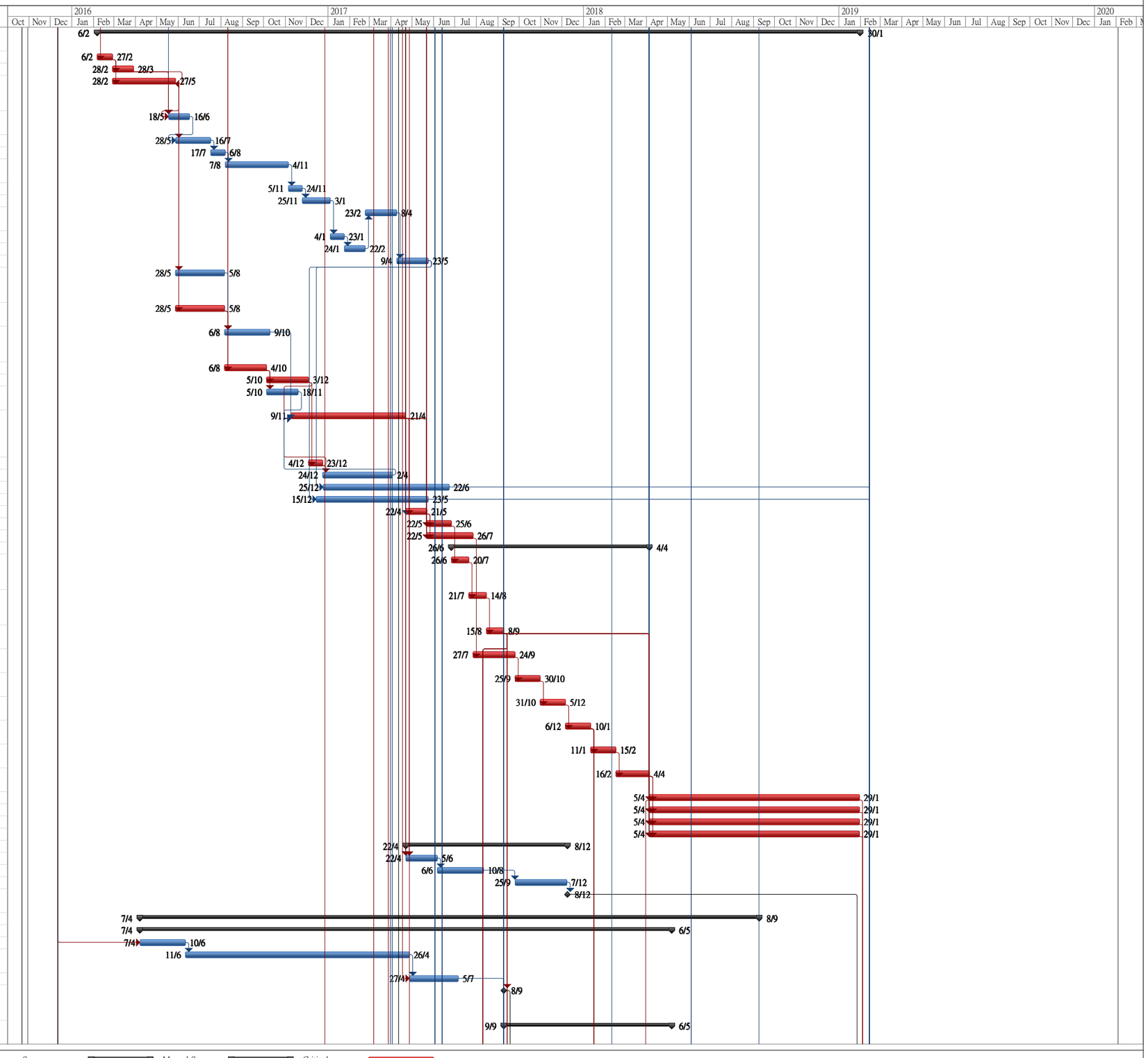
ID	ID	Task Name	Duration	Start	Finish
334	**S3600**	**Site Formation and Bored Pile Wall for Logistics Center cum Alum Saturation Tank**	**1090 days**	**Sat 6/2/16**	**Wed 30/1/19**
335	S36001	Site Clearance	22 days	Sat 6/2/16	Sat 27/2/16
336	S36002	Learing curve and resolution of early teething problems	30 days	Sun 28/2/16	Mon 28/3/16
337	S36003	Excavation for slope slope behind the bored pile wall C and reduce the level to +45.0mPD (Stage 1) (About 100 vehicles per day)	90 days	Sun 28/2/16	Fri 27/5/16
338	S36004	Installation of temp soil nails (60 deg. Temp slope above Haul Road)	30 days	Wed 18/5/16	Thu 16/6/16
339	S36005	Pre-drill for bored piles	50 days	Sat 28/5/16	Sat 16/7/16
340	S36006	Bored piling machine establishment	21 days	Sun 17/7/16	Sat 6/8/16
341	S36007	Construction of bored piles CB (H 10m, L 80m, Dia 2.0m)	90 days	Sun 7/8/16	Fri 4/11/16
342	S36008	ELS works for CB bored piles	20 days	Sat 5/11/16	Thu 24/11/16
343	S36009	Temp. excavation for CB bored piles construction	40 days	Fri 25/11/16	Tue 3/1/17
344	S36010	Construction of bored piles CC (H 10m L 80m Dia 2.0m)	45 days	Thu 23/2/17	Sat 8/4/17
345	S36011	ELS works for CB bored piles	20 days	Wed 4/1/17	Mon 23/1/17
346	S36012	Temp. excavation for CB bored piles construction	30 days	Tue 24/1/17	Wed 22/2/17
347	S36013	Construction of bored piles CA (H 10m L 80m Dia. 2m)	45 days	Sun 9/4/17	Tue 23/5/17
348	S36014	Excavation at logistics center and Alum saturation tank location to level +33mPD (Stage 2) (About 100 vehicles per day)	70 days	Sat 28/5/16	Fri 5/8/16
349	S36015	Installation of temp soil nails (60 deg. Temp slope above Haul Road)	70 days	Sat 28/5/16	Fri 5/8/16
350	S36016	Excavation at the open area between bored pile wall C and Logistics Center to formation +23.5mPD (Stage 3) (About 100 vehicles per day)	65 days	Sat 6/8/16	Sun 9/10/16
351	S36017	Installation of sheet piles/pipe pile at level +33mPD	60 days	Sat 6/8/16	Tue 4/10/16
352	S36018	Installation of sheet piles/pipe pile at level +27.5mPD	60 days	Wed 5/10/16	Sat 3/12/16
353	S36019	Installation of tie back for level +33mPD sheet piles/ pipe piles	45 days	Wed 5/10/16	Fri 18/11/16
354	S36020	Excavation at logistics center and Alum saturation tank location to formation level +20mPD (Stage 4) (About 100 vehicles per day)	164 days	Wed 9/11/16	Fri 21/4/17
355	S36021	King post installation	20 days	Sun 4/12/16	Fri 23/12/16
356	S36022	Temp. shoring (waling & strut) installation	100 days	Sat 24/12/16	Sun 2/4/17
357	S36023	Construction of bored piles lagging walls	180 days	Sun 25/12/16	Thu 22/6/17
358	S36024	Constrution of bored pile capping beam	160 days	Thu 15/12/16	Tue 23/5/17
359	S36025	Installation of earth mat	30 days	Sat 22/4/17	Sun 21/5/17
360	S36026	Foundation for grid 1-6	35 days	Mon 22/5/17	Sun 25/6/17
361	S36027	Foundation for reminding portion	66 days	Mon 22/5/17	Wed 26/7/17
362	S36028	Superstructure for Logistic Center	283 days	Mon 26/6/17	Wed 4/4/18
363	S36029	Completion of concrete structure of grid(1-5) Basement Level +22.5mpd to +28.5mpd of WTW Logistics Centre	25 days	Mon 26/6/17	Thu 20/7/17
364	S36030	Completion of concrete structure of grid(1-5) Ground Level +28.5mpd to +34.5mpd of WTW Logistics Centre	25 days	Fri 21/7/17	Mon 14/8/17
365	S36031	Completion of concrete structure of grid(1-5) Frist Level 34.5mpd to 40.5mpd of WTW Logistics Centre	25 days	Tue 15/8/17	Fri 8/9/17
366	S36032	Completion of concrete structure of Basement Level of WTW Logistics Centre	60 days	Thu 27/7/17	Sun 24/9/17
367	S36033	Completion of concrete structure of Ground Level of WTW Logistics Centre	36 days	Mon 25/9/17	Mon 30/10/17
368	S36034	Completion of concrete structure of First Level of WTW Logistics Centre	36 days	Tue 31/10/17	Tue 5/12/17
369	S36035	Completion of concrete structure of Second Level of WTW Logistics Centre	36 days	Wed 6/12/17	Wed 10/1/18
370	S36036	Completion of concrete structure of Third Level of WTW Logistics Centre	36 days	Thu 11/1/18	Thu 15/2/18
371	S36037	Completion of concrete structure of Roof Level of WTW Logistics Centre	48 days	Fri 16/2/18	Wed 4/4/18
372	S36038	Plumbing and Drainage installation	300 days	Thu 5/4/18	Tue 29/1/19
373	S36039	MVAC installation	300 days	Thu 5/4/18	Tue 29/1/19
374	S36040	Fire Services installation	300 days	Thu 5/4/18	Tue 29/1/19
375	S36041	Electrical installation	300 days	Thu 5/4/18	Tue 29/1/19
376	**S36042**	**Alum Satuation Tanks**	**231 days**	**Sat 22/4/17**	**Fri 8/12/17**
377	S36043	Foundation	45 days	Sat 22/4/17	Mon 5/6/17
378	S36044	Superstructure for Alum Satuation Tanks	66 days	Tue 6/6/17	Thu 10/8/17
379	S36045	Canopy above Alum Saturation Tanks	74 days	Mon 25/9/17	Thu 7/12/17
380	S36046	Completion of structure including canopy above Alum Saturation Tanks	1 day	Fri 8/12/17	Fri 8/12/17
381	**S36047**	**WTW Logistic Centre - Internal E&M Site Works**	**885 days**	**Thu 7/4/16**	**Sat 8/9/18**
382	**S36048**	**WTW Logistics Centre - Silo Installation B/F**	**760 days**	**Thu 7/4/16**	**Sun 6/5/18**
383	S36049	WTWLC - Lime System - Silo Procurement	65 days	Thu 7/4/16	Fri 10/6/16
384	S36050	WTWLC - Lime System - Silo Manufacturing & FAT	320 days	Sat 11/6/16	Wed 26/4/17
385	S36051	WTWLC - Lime System - Silo Delivery	70 days	Thu 27/4/17	Wed 5/7/17
386	S36052	WTWLC - Second 2/F Slab G.L. CH-1~CH-5 - H/O by Civil Contractor (i.e. Area available from Level +22.5 to +40.5)	0 days	Fri 8/9/17	Fri 8/9/17
387	**S36053**	**WTWLC - Lime System - Silo Site Works Duration***	**240 days**	**Sat 9/9/17**	**Sun 6/5/18**



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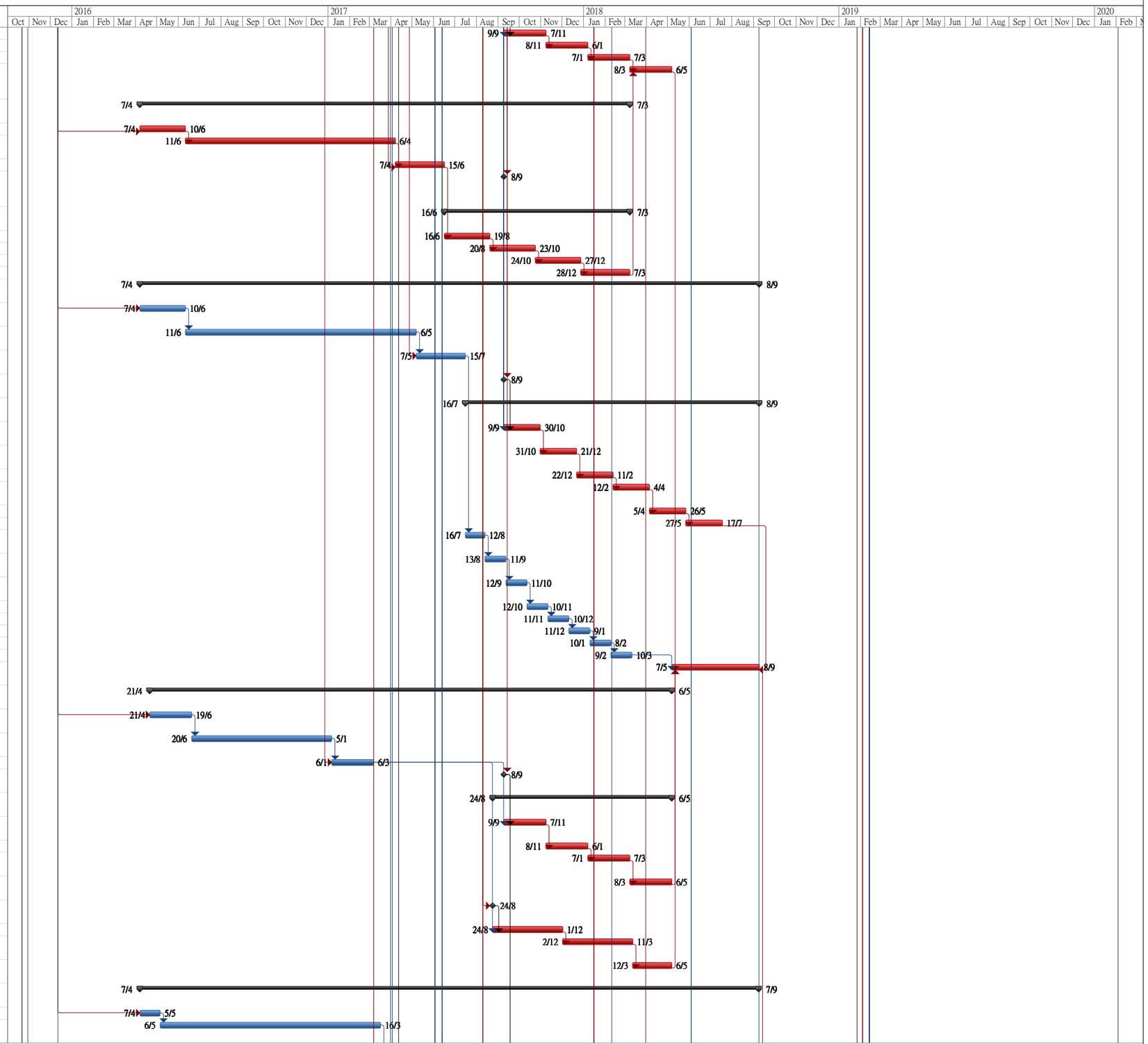
ID	ID	Task Name	Duration	Start	Finish
388	S36054	WTWLC - Lime System - Silo No.1	60 days	Sat 9/9/17	Tue 7/11/17
389	S36055	WTWLC - Lime System - Silo No.2	60 days	Wed 8/11/17	Sat 6/1/18
390	S36056	WTWLC - Lime System - Silo No.3	60 days	Sun 7/1/18	Wed 7/3/18
391	S36057	WTWLC - Lime System - Silo No.4 (Late commencement so as to allow access for Saturators delivery and installation)	60 days	Thu 8/3/18	Sun 6/5/18
392	**S36058**	**WTW Logistics Centre - Saturators Installation B/F**	**700 days**	**Thu 7/4/16**	**Wed 7/3/18**
393	S36059	WTWLC - Lime System - Saturators Procurement	65 days	Thu 7/4/16	Fri 10/6/16
394	S36060	WTWLC - Lime System - Saturators Manufacturing & FAT	300 days	Sat 11/6/16	Thu 6/4/17
395	S36061	WTWLC - Lime System - Saturators Delivery	70 days	Fri 7/4/17	Thu 15/6/17
396	S36062	WTWLC - Second 2/F Slab G.L. CH-1~CH-5 - H/O by Civil Contractor (i.e. Area available from Level +22.5 to +40.5)	0 days	Fri 8/9/17	Fri 8/9/17
397	**S36063**	**WTWLC - Lime System - Saturators Site Works Duration**	**265 days**	**Fri 16/6/17**	**Wed 7/3/18**
398	S36064	WTWLC - Lime System - Saturators No.1	65 days	Fri 16/6/17	Sat 19/8/17
399	S36065	WTWLC - Lime System - Saturators No.2	65 days	Sun 20/8/17	Mon 23/10/17
400	S36066	WTWLC - Lime System - Saturators No.3	65 days	Tue 24/10/17	Wed 27/12/17
401	S36067	WTWLC - Lime System - Saturators No.4	70 days	Thu 28/12/17	Wed 7/3/18
402	**S36068**	**WTW Logistics Centre - Various Dosing System & Pipeworks G/F**	**885 days**	**Thu 7/4/16**	**Sat 8/9/18**
403	S36069	WTWLC - Chemcial Dosing System & pipeworks Procurement	65 days	Thu 7/4/16	Fri 10/6/16
404	S36070	WTWLC - Chemcial Dosing System & pipeworks Manufacturing & FAT	330 days	Sat 11/6/16	Sat 6/5/17
405	S36071	WTWLC - Chemcial Dosing System & pipeworks Delivery	70 days	Sun 7/5/17	Sat 15/7/17
406	S36072	WTWLC - First 1/F Slab G.L. AS-4~CH-1 - H/O by Civil Contractor	0 days	Fri 8/9/17	Fri 8/9/17
407	**S36073**	**WTWLC - Various Dosing System & Pipeworks Site Works Duration***	**420 days**	**Sun 16/7/17**	**Sat 8/9/18**
408	S36074	WTWLC - Lime System - Pre-Lime Dosing - South Works	52 days	Sat 9/9/17	Mon 30/10/17
409	S36075	WTWLC - Lime System Sludge Recycling System	52 days	Tue 31/10/17	Thu 21/12/17
410	S36076	WTWLC - Lime System - Solution Tank	52 days	Fri 22/12/17	Sun 11/2/18
411	S36077	WTWLC - Lime System - Post Lime Dosing - South Work	52 days	Mon 12/2/18	Wed 4/4/18
412	S36078	WTWLC - Lime System - Depacking Unit	52 days	Thu 5/4/18	Sat 26/5/18
413	S36079	WTWLC - Waste Chemical Storage Tank	52 days	Sun 27/5/18	Tue 17/7/18
414	S36080	WTWLC - Floc-Aid Polymer Dosing - South Works	28 days	Sun 16/7/17	Sat 12/8/17
415	S36081	WTWLC - Floc-Aid Polymer Transfer - North Works	30 days	Sun 13/8/17	Mon 11/9/17
416	S36082	WTWLC - Residuals Polymer Dosing - South Work	30 days	Tue 12/9/17	Wed 11/10/17
417	S36083	WTWLC - Polymer Preparation System	30 days	Thu 12/10/17	Fri 10/11/17
418	S36084	WTWLC - Polymer Dilution System	30 days	Sat 11/11/17	Sun 10/12/17
419	S36085	WTWLC - Fluoride Preparation System	30 days	Mon 11/12/17	Tue 9/1/18
420	S36086	WTWLC - Fluoride Dosing System	30 days	Wed 10/1/18	Thu 8/2/18
421	S36087	WTWLC - Filter-Aid Polymer Dosing System	30 days	Fri 9/2/18	Sat 10/3/18
422	S36088	WTWLC - All interconnecting fittings & pipeworks	125 days	Mon 7/5/18	Sat 8/9/18
423	**S36089**	**WTW Logistics Centre - Auxiliary System & field pipeworks**	**746 days**	**Thu 21/4/16**	**Sun 6/5/18**
424	S36090	WTWLC - Aux. Sys. & Field pipeworks Procurement	60 days	Thu 21/4/16	Sun 19/6/16
425	S36091	WTWLC - Aux. Sys. & Field pipeworks Manufacturing & FAT	200 days	Mon 20/6/16	Thu 5/1/17
426	S36092	WTWLC - Aux. Sys. & Field pipeworks Delivery	60 days	Fri 6/1/17	Mon 6/3/17
427	S36093	WTWLC - First 1/F Slab G.L. AS-4~CH-1 - H/O by Civil Contractor	0 days	Fri 8/9/17	Fri 8/9/17
428	**S36094**	**WTWLC - Aux. Sys. & Field pipeworks Site Works Duration***	**256 days**	**Thu 24/8/17**	**Sun 6/5/18**
429	S36095	WTWLC - Instrument Air Compressor System (First Level slab completed as ceiling)	60 days	Sat 9/9/17	Tue 7/11/17
430	S36096	WTWLC - Central Dust Collection System	60 days	Wed 8/11/17	Sat 6/1/18
431	S36097	WTWLC - Powdered Activated Carbon Preparation and Dosing System	60 days	Sun 7/1/18	Wed 7/3/18
432	S36098	WTWLC - E&M Works new dosing & service water pipework	60 days	Thu 8/3/18	Sun 6/5/18
433	S36099	WTWLC - All trenches for new dosing & service water pipework - H/O by Civil Contractor	0 days	Thu 24/8/17	Thu 24/8/17
434	S36100	WTWLC - Chem Dosing pipeworks to TWPS	100 days	Thu 24/8/17	Fri 1/12/17
435	S36101	WTWLC - Chem Dosing pipeworks to Raw Water Inlet	100 days	Sat 2/12/17	Sun 11/3/18
436	S36102	WTWLC - Plant services water line from TWPS to WTW Logistics Centre	56 days	Mon 12/3/18	Sun 6/5/18
437	**S36103**	**WTW Logistics Centre - Elect. Works Cabling/MCC/LCP/ALCP/DC**	**884 days**	**Thu 7/4/16**	**Fri 7/9/18**
438	S36104	WTWLC - Electrical Equipment Procurement	29 days	Thu 7/4/16	Thu 5/5/16
439	S36105	WTWLC - Electrical Equipment Manufacturing & FAT	315 days	Fri 6/5/16	Thu 16/3/17



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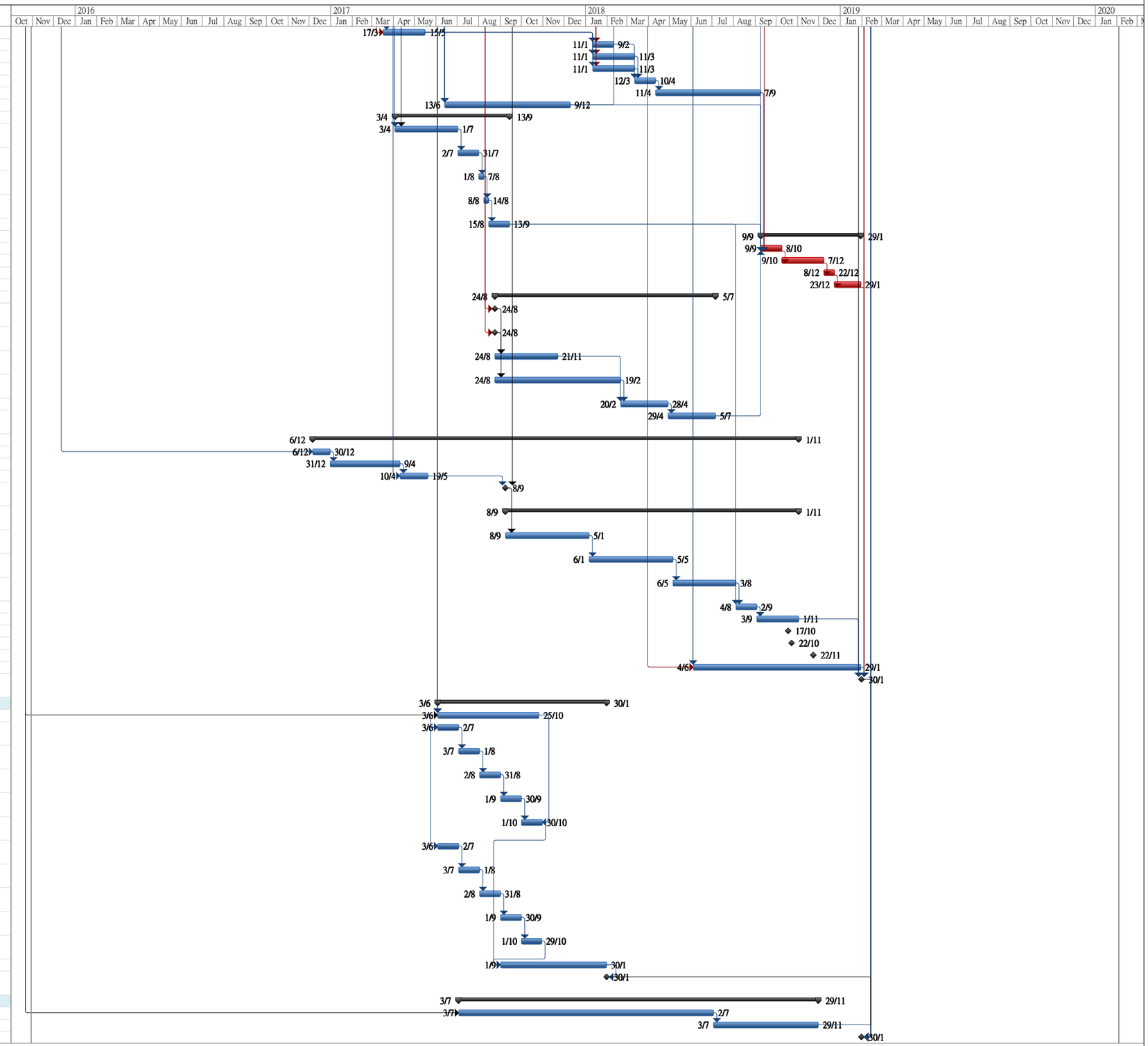
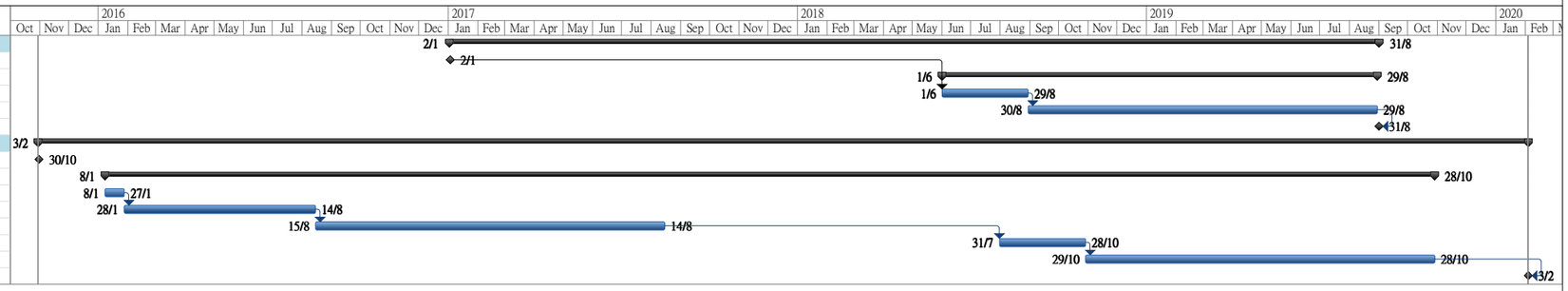
ID	ID	Task Name	Duration	Start	Finish
440	S36106	WTWLC - Electrical Equipment Delivery	60 days	Fri 17/3/17	Mon 15/5/17
441	S36107	WTWLC - Electrical Battery Room Installation	30 days	Thu 11/1/18	Fri 9/2/18
442	S36108	WTWLC - Tx Room Installation	60 days	Thu 11/1/18	Sun 11/3/18
443	S36109	WTWLC - Electrical LVSB Installation	60 days	Thu 11/1/18	Sun 11/3/18
444	S36110	WTWLC - Energisation	30 days	Mon 12/3/18	Tue 10/4/18
445	S36111	WTWLC - Cabling works & Termination	150 days	Wed 11/4/18	Fri 7/9/18
446	S36112	WTWLC - DCS	180 days	Tue 13/6/17	Sat 9/12/17
447	**S36113**	**WTW Logistics Centre - HV Works**	**164 days**	**Mon 3/4/17**	**Wed 13/9/17**
448	S36114	WTWLC/NWTPH - 11KV Supply Installation incl. HVSB at 1/F of TPH	90 days	Mon 3/4/17	Sat 1/7/17
449	S36115	WTWLC/NWTPH - CLP Mobilization for 11KV Power Source	30 days	Sun 2/7/17	Mon 31/7/17
450	S36116	WTWLC/NWTPH - CLP T&C of the completed 11 kV HV cables	7 days	Tue 1/8/17	Mon 7/8/17
451	S36117	WTWLC/NWTPH - 11KV Switchboard T&C incl. CLP - Partial due to incompletion of WTWLC	7 days	Tue 8/8/17	Mon 14/8/17
452	S36118	WTWLC/NWTPH - 11kV Energisation	30 days	Tue 15/8/17	Wed 13/9/17
453	**S36119**	**WTW Logistics Centre - T&C**	**143 days**	**Sun 9/9/18**	**Tue 29/1/19**
454	S36120	WTWLC - T&C Individual Test	30 days	Sun 9/9/18	Mon 8/10/18
455	S36121	WTWLC - T&C Preliminary Test	60 days	Tue 9/10/18	Fri 7/12/18
456	S36122	WTWLC - T&C Precommissioning Test	15 days	Sat 8/12/18	Sat 22/12/18
457	S36123	WTWLC - T&C Commissioning Test	38 days	Sun 23/12/18	Tue 29/1/19
458	**S36124**	**WTW Logistic Centre - External E&M Site Works**	**316 days**	**Thu 24/8/17**	**Thu 5/7/18**
459	S36125	WTWLC - T02 Trench/Civil Works - H/O by Civil Contractor	0 days	Thu 24/8/17	Thu 24/8/17
460	S36126	WTWLC - T03 Trench/Civil Works - H/O by Civil Contractor	0 days	Thu 24/8/17	Thu 24/8/17
461	S36127	WTWLC - Installation of new Process pipeline to existing dosing points	90 days	Thu 24/8/17	Tue 21/11/17
462	S36128	WTWLC - PSW From Existing treated water pump house	180 days	Thu 24/8/17	Mon 19/2/18
463	S36129	WTWLC - Plant Service Water System	68 days	Tue 20/2/18	Sat 28/4/18
464	S36130	WTWLC - Plant Service Water High Pressure System	68 days	Sun 29/4/18	Thu 5/7/18
465	**S36131**	**Saturation Tanks - E&M Works**	**696 days**	**Tue 6/12/16**	**Thu 1/11/18**
466	S36132	Saturation Tanks - Alum System Procurement	25 days	Tue 6/12/16	Fri 30/12/16
467	S36133	Saturation Tanks - Alum System Manufacturing & FAT	100 days	Sat 31/12/16	Sun 9/4/17
468	S36134	Saturation Tanks - Alum System Delivery	40 days	Mon 10/4/17	Fri 19/5/17
469	S36135	Saturation Tanks - First 1/F Slab G.L. AS-4~CH-1 - H/O by Civil Contractor	0 days	Fri 8/9/17	Fri 8/9/17
470	S36136	Saturation Tanks - Alum System Site Works Duration*	420 days	Fri 8/9/17	Thu 1/11/18
471	S36137	Saturation Tanks - Alum System - Saturation Tanks Mixers & Accessories	120 days	Fri 8/9/17	Fri 5/1/18
472	S36138	Saturation Tanks - Alum System - Process pumps & Solution tank	120 days	Sat 6/1/18	Sat 5/5/18
473	S36139	Saturation Tanks - Alum System - Electrical & ICA Installation	90 days	Sun 6/5/18	Fri 3/8/18
474	S36140	Saturation Tanks - Alum System - Energisation	30 days	Sat 4/8/18	Sun 2/9/18
475	S36141	Saturation Tanks - Alum System - T&C	60 days	Mon 3/9/18	Thu 1/11/18
476	S36142	EMSD inspection of lift	1 day	Wed 17/10/18	Wed 17/10/18
477	S36143	WSD inspection	1 day	Mon 22/10/18	Mon 22/10/18
478	S36144	FSD inspection	1 day	Thu 22/11/18	Thu 22/11/18
479	S36145	Finishing works	240 days	Mon 4/6/18	Tue 29/1/19
480	S36146	Completion of architectural finishes and relevant building works (both internal and external)	1 day	Wed 30/1/19	Wed 30/1/19
481	**S3700**	**Piping Works**	**242 days**	**Sat 3/6/17**	**Tue 30/1/18**
482	S3701	Excavation for piping works	145 days	Sat 3/6/17	Wed 25/10/17
483	S3702	Trench and steel frame construction (Completion of 20% of all civil works of Process Piping)	30 days	Sat 3/6/17	Sun 2/7/17
484	S3703	Trench and steel frame construction (Completion of 40% of all civil works of Process Piping)	30 days	Mon 3/7/17	Tue 1/8/17
485	S3704	Trench and steel frame construction (Completion of 60% of all civil works of Process Piping)	30 days	Wed 2/8/17	Thu 31/8/17
486	S3705	Trench and steel frame construction (Completion of 80% of all civil works of Process Piping)	30 days	Fri 1/9/17	Sat 30/9/17
487	S3706	Trench and steel frame construction (Completion of 100% of all civil works of Process Piping)	30 days	Sun 1/10/17	Mon 30/10/17
488	S3707	Pipe line installation (Completion of 20% of all E&M works of Process Piping)	30 days	Sat 3/6/17	Sun 2/7/17
489	S3708	Pipe line installation (Completion of 40% of all E&M works of Process Piping)	30 days	Mon 3/7/17	Tue 1/8/17
490	S3709	Pipe line installation (Completion of 60% of all E&M works of Process Piping)	30 days	Wed 2/8/17	Thu 31/8/17
491	S3710	Pipe line installation (Completion of 80% of all E&M works of Process Piping)	30 days	Fri 1/9/17	Sat 30/9/17
492	S3711	Pipe line installation (Completion of 100% of all E&M works of Process Piping)	29 days	Sun 1/10/17	Sun 29/10/17
493	S3712	Pipe Line Testing	152 days	Fri 1/9/17	Tue 30/1/18
494	S3713	Completion of all site testing and operation commissioning	1 day	Tue 30/1/18	Tue 30/1/18
495	**S3800**	**Road Works**	**515 days**	**Mon 3/7/17**	**Thu 29/11/18**
496	S3801	Road drainage and kerb construction	365 days	Mon 3/7/17	Mon 2/7/18
497	S3802	Construction of road surface	150 days	Tue 3/7/18	Thu 29/11/18
498	**S3803**	**Section 3 Completion**	**1 day**	**Wed 30/1/19**	**Wed 30/1/19**



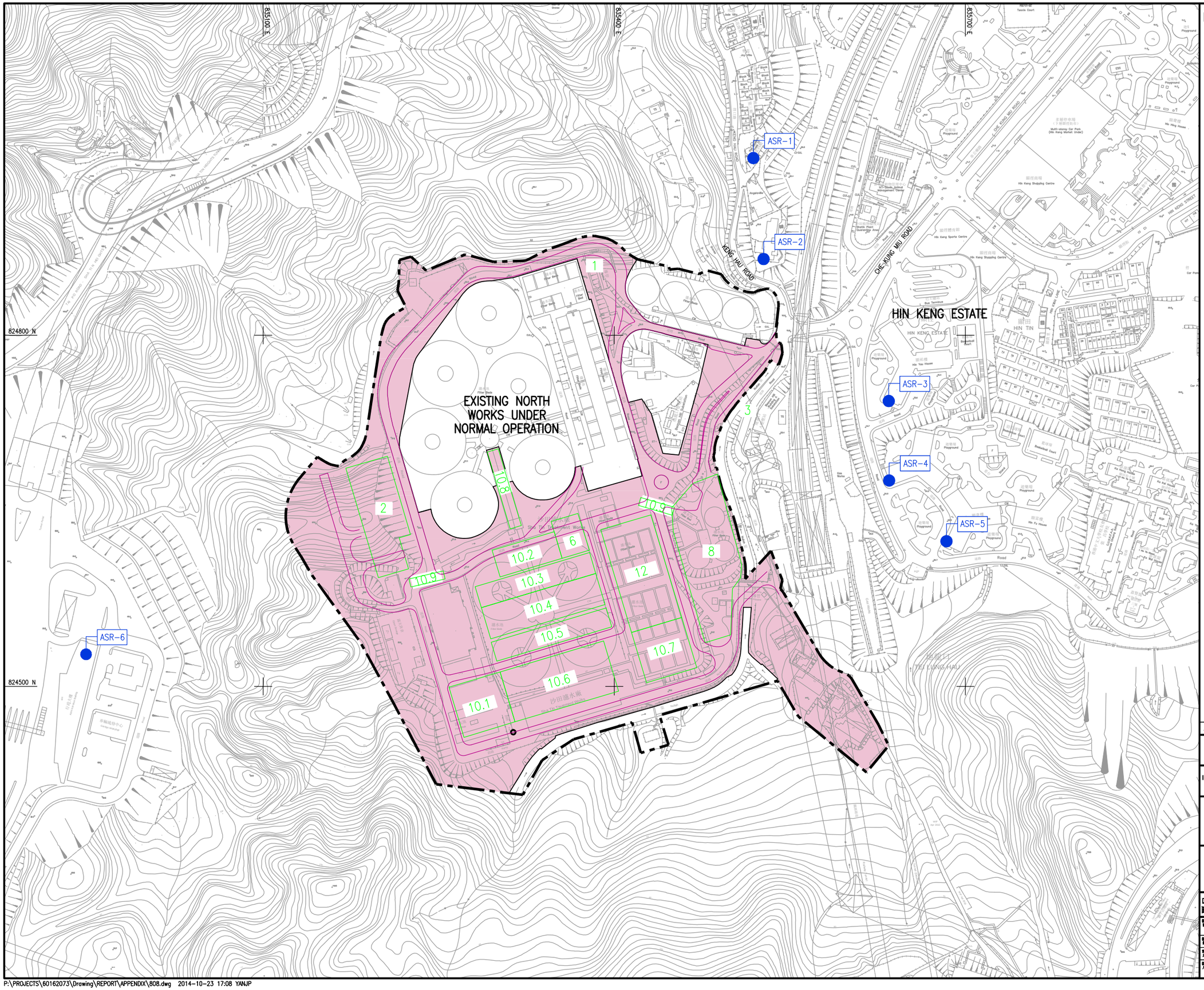
Critical Split | Task | Milestone | Summary | Manual Summary | Critical

ID	ID	Task Name	Duration	Start	Finish
499	**S4000**	**Section 4**	**972 days**	**Mon 2/1/17**	**Sat 31/8/19**
500	**S4001**	**Section 4 Commencement**	**1 day**	**Mon 2/1/17**	**Mon 2/1/17**
501	**S4100**	**Landscaping Softworks & Establishment Works**	**455 days**	**Fri 1/6/18**	**Thu 29/8/19**
502	S4101	Landscaping Soft works	90 days	Fri 1/6/18	Wed 29/8/18
503	S4102	Establishment works	365 days	Thu 30/8/18	Thu 29/8/19
504	**S4002**	**Section 4 Completion**	**1 day**	**Sat 31/8/19**	**Sat 31/8/19**
505	**S5000**	**Section 5**	**1558 days**	**Fri 30/10/15**	**Mon 3/2/20**
506	**S5001**	**Section 5 Commencement**	**1 day**	**Fri 30/10/15**	**Fri 30/10/15**
507	**S5100**	**Landscaping Softworks & Establishment Works**	**1390 days**	**Fri 8/1/16**	**Mon 28/10/19**
508	S5101	Preparation of site area for planting works	20 days	Fri 8/1/16	Wed 27/1/16
509	S5102	Transplanting works	200 days	Thu 28/1/16	Sun 14/8/16
510	S5103	Establishment for transplanting works	365 days	Mon 15/8/16	Mon 14/8/17
511	S5104	Landscaping Soft works	90 days	Tue 31/7/18	Sun 28/10/18
512	S5105	Establishment works	365 days	Mon 29/10/18	Mon 28/10/19
513	**S5002**	**Section 5 Completion**	**1 day**	**Mon 3/2/20**	**Mon 3/2/20**



Critical Split | Task | Milestone | Summary | Manual Summary | Critical

Appendix D
Location of Construction Activities



LEGEND:

	SITE BOUNDARY OF SHA TIN WATER TREATMENT WORKS
	WORKS AREA
	RESPRESENTATIVE AIR SENSITIVE RECEIVERS (ASRS)
ASR-1	THE BLOSSOM PHASE 4
ASR-2	THE L LOUEY
ASR-3	HIN KENG ESTATE – HIN YAU HOUSE
ASR-4	HIN KENG ESTATE – HIN WAN HOUSE
ASR-5	HIN KENG ESTATE – HIN KWAI HOUSE
ASR-6	SHA TIN HEIGHT TUNNEL ADMINISTRATION BUILDING
1	RETAINING WALL AND NEW ACCESS ROAD
2	WATER TREATMENT WORKS LOGISTICS CENTRE
3	UPGRADED MAIN ENTRY ROAD
6	WASHWATER EQUALIZATION TANKS (NORTH WORKS)
8	DEMOLITION OF EXISTING WASHWATER RECOVERY TANKS
10	CONSTRUCTION OF SOUTH WORKS
10.1	RESIDUAL MANAGEMENT FACILITIES
10.2	PRE-OZONATION HOUSE AND COAGULATION TANKS
10.3	FLOCCULATION TANKS
10.4	HIGH RATE SEDIMENTATION TANKS
10.5	INTERMEDIATE OZONATION HOUSE
10.6	STAGE 1 BIOLOGICAL FILTERS
10.7	SOUTH WORKS PUMPING STATION
10.8	INLET CHANNEL STATIC MIXERS (NORTH WORKS)
10.9	PEDESTRIAN WALKWAY
12	STAGE 2 GRANULAR MEDIA FILTERS & UV REACTORS
13	OPERATION OF HAUL ROAD

REV. 修訂	DESCRIPTION 內容摘要	BY 由	CHKD'D 審核	DATE 日期

水 務 署
WATER SUPPLIES DEPARTMENT

AGREEMENT NO. CE 13/2009 (WS)
IN-SITU REPROVISIONING OF SHA TIN WATER TREATMENT WORKS-SOUTH WORKS
DESIGN AND CONSTRUCTION

LOCATIONS OF CONSTRUCTION WORKS AREA

AECOM

DRG.NO. 圖紙編號 60162073/FIGURE 4.2

DESIGNED BY 設計 –	CONTRACT NO. 合約編號	P. CK. APPROVED 批准人
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SCALE 比例 A3 1 : 3000		
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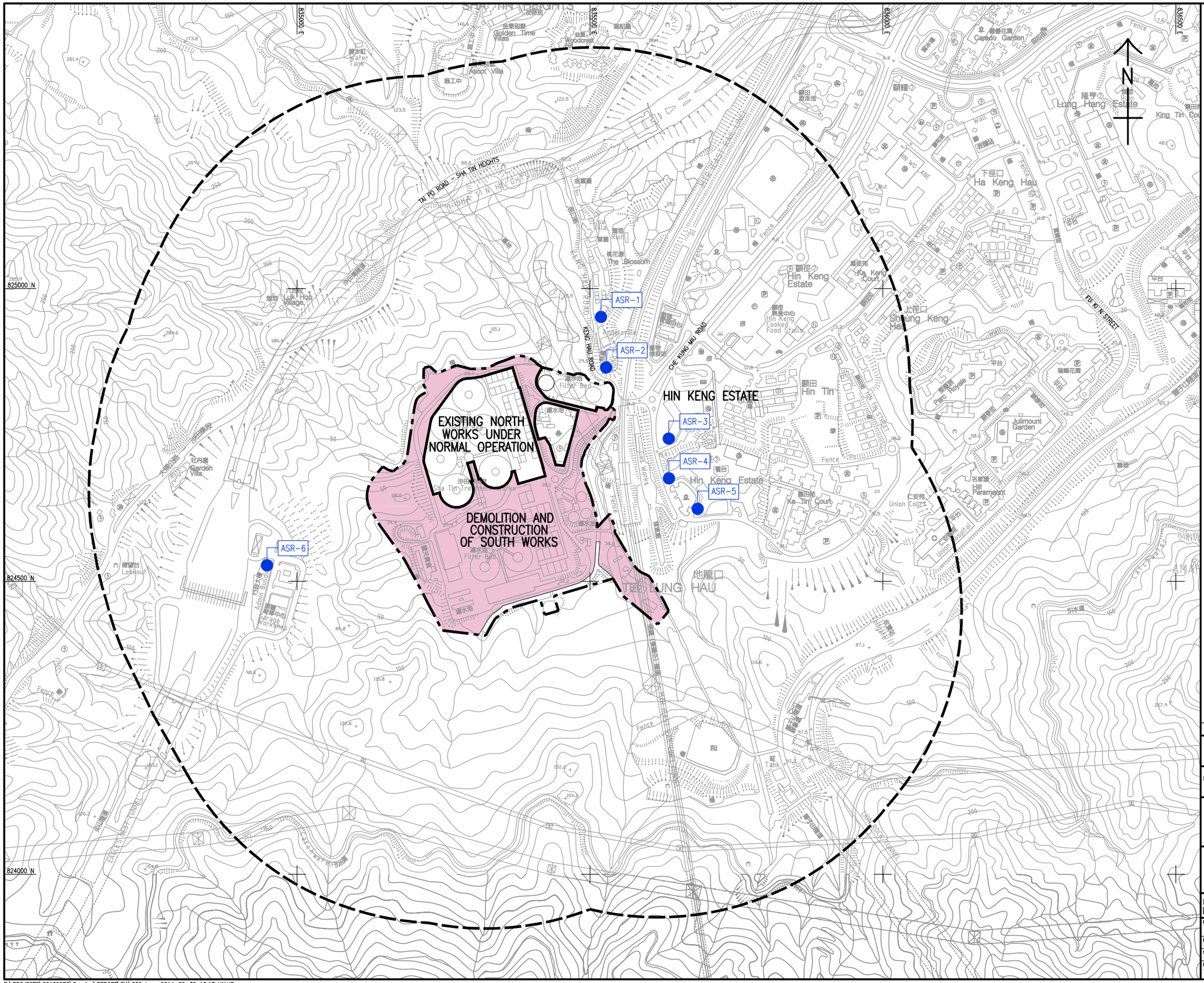
Appendix E
Environmental Sensitive Receivers in the Vicinity of the Project



LEGEND:

- SITE BOUNDARY OF SHA TIN WATER TREATMENT WORKS
- STUDY AREA (500m BOUNDARY)
- WORKS AREA
- RESPRESENTATIVE AIR SENSITIVE RECEIVERS (ASRS)

ASR-1	THE BLOSSOM PHASE 4
ASR-2	THE L LOUEY
ASR-3	HIN KENG ESTATE – HIN YAU HOUSE
ASR-4	HIN KENG ESTATE – HIN WAN HOUSE
ASR-5	HIN KENG ESTATE – HIN KWAI HOUSE
ASR-6	SHA TIN HEIGHT TUNNEL ADMINISTRATION BUILDING

REV. 修訂	DESCRIPTION 內容修訂	BY 由	CHECKED 核對	DATE 日期

水 務 署
WATER SUPPLIES DEPARTMENT

AGREEMENT NO. CE 13/2009 (WS)
IN-SITU REPROVISIONING OF SHA TIN WATER TREATMENT WORKS-SOUTH WORKS
DESIGN AND CONSTRUCTION

LOCATIONS OF REPRESENTATIVE AIR SENSITIVE RECEIVERS

AECOM

DRG.NO. 圖紙編號 60162073/EIA/FIG 4.1

DESIGNED BY 設計 –	CONTRACT NO. 合約編號	P. DIV. APPROVED 批准人
DRAWN BY 繪圖 NHP	STATUS 階段	
SCALE 比例 A3 1 : 6000		
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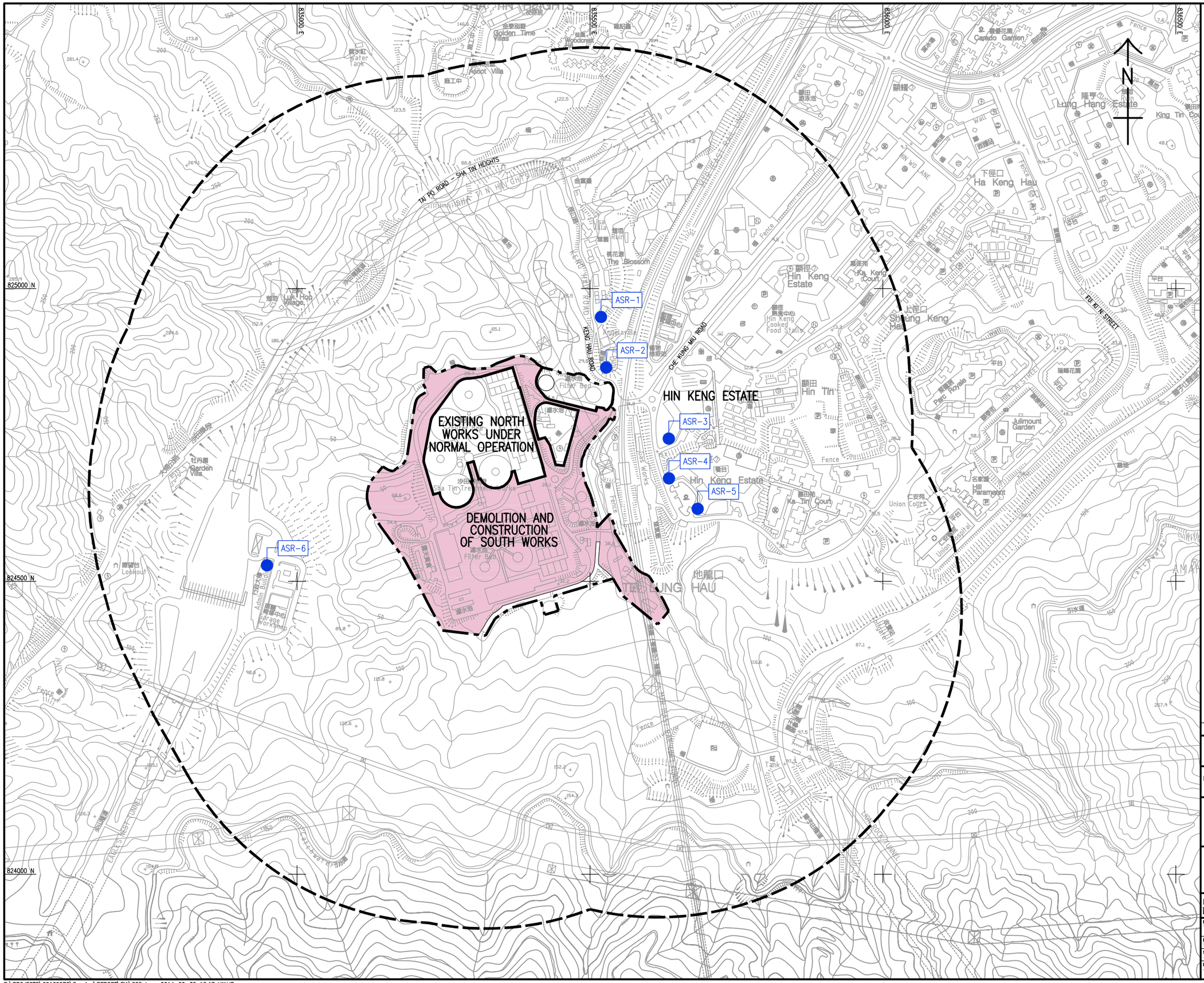

LEGEND:

- SITE BOUNDARY OF SHA TIN WATER TREATMENT WORKS
- STUDY AREA (500m BOUNDARY)
- WORKS AREA
- RESPRESENTATIVE AIR SENSITIVE RECEIVERS (ASRS)

ASR-1	THE BLOSSOM PHASE 4
ASR-2	THE L LOUEY
ASR-3	HIN KENG ESTATE – HIN YAU HOUSE
ASR-4	HIN KENG ESTATE – HIN WAN HOUSE
ASR-5	HIN KENG ESTATE – HIN KWAI HOUSE
ASR-6	SHA TIN HEIGHT TUNNEL ADMINISTRATION BUILDING

REV. 修訂	DESCRIPTION 內容修訂	BY 由	CHECKED 核對	DATE 日期

水 務 署
WATER SUPPLIES DEPARTMENT

AGREEMENT NO. CE 13/2009 (WS)
IN-SITU REPROVISIONING OF SHA TIN WATER TREATMENT WORKS-SOUTH WORKS
DESIGN AND CONSTRUCTION

LOCATIONS OF REPRESENTATIVE AIR SENSITIVE RECEIVERS

AECOM

DRG.NO. 圖紙編號 60162073/EIA/FIG 4.1

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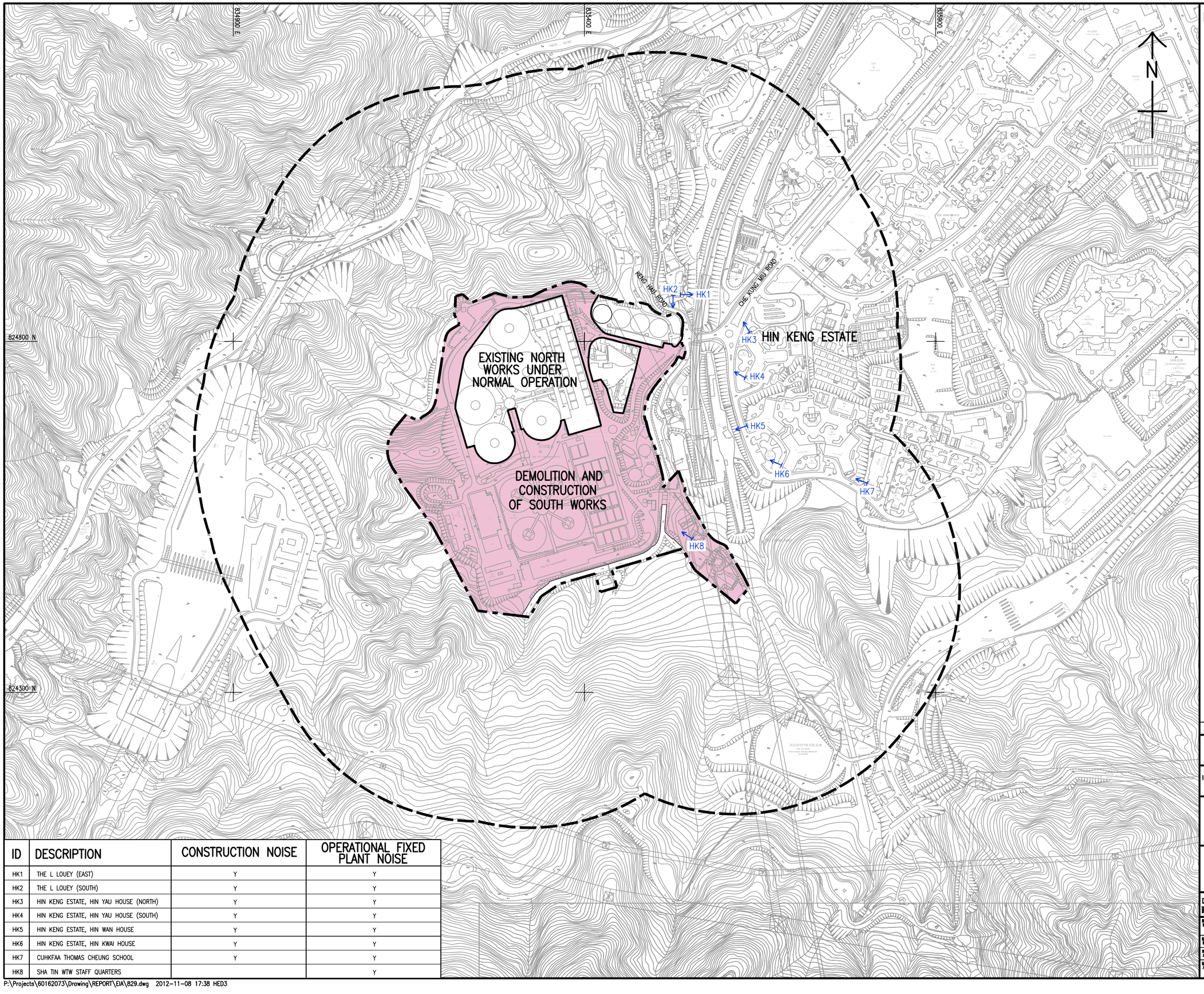

LEGEND:

- SITE BOUNDARY OF SHA TIN WATER TREATMENT WORKS
- 300m STUDY AREA
- WORKS AREA
- HK1 — REPRESENTATIVE NOISE SENSITIVE RECEIVERS

ID	DESCRIPTION	CONSTRUCTION NOISE	OPERATIONAL FIXED PLANT NOISE
HK1	THE L LOUEY (EAST)	Y	Y
HK2	THE L LOUEY (SOUTH)	Y	Y
HK3	HIN KENG ESTATE, HIN YAU HOUSE (NORTH)	Y	Y
HK4	HIN KENG ESTATE, HIN YAU HOUSE (SOUTH)	Y	Y
HK5	HIN KENG ESTATE, HIN WAN HOUSE	Y	Y
HK6	HIN KENG ESTATE, HIN KWAI HOUSE	Y	Y
HK7	CUHKFAA THOMAS CHEUNG SCHOOL	Y	Y
HK8	SHA TIN WTW STAFF QUARTERS		Y

REV. 修訂 | DESCRIPTION 內容修訂 | BY 由 | CHK'D 核准 | DATE 日期

水 務 署
WATER SUPPLIES DEPARTMENT

AGREEMENT NO. CE 13/2009 (WS)
IN-SITU REPROVISIONING OF SHA TIN WATER TREATMENT WORKS-SOUTH WORKS
DESIGN AND CONSTRUCTION

LOCATIONS OF REPRESENTATIVE NOISE SENSITIVE RECEIVERS

AECOM

DRG.NO. 圖紙編號 60162073/EIA/FIG 5.1

DESIGNED BY 設計 –
CONTRACT NO. 合約編號
P. DR. APPROVED 批准人
DRAWN BY 繪圖 LJ
STATUS 種類
SCALE 比例 A3 1 : 5000
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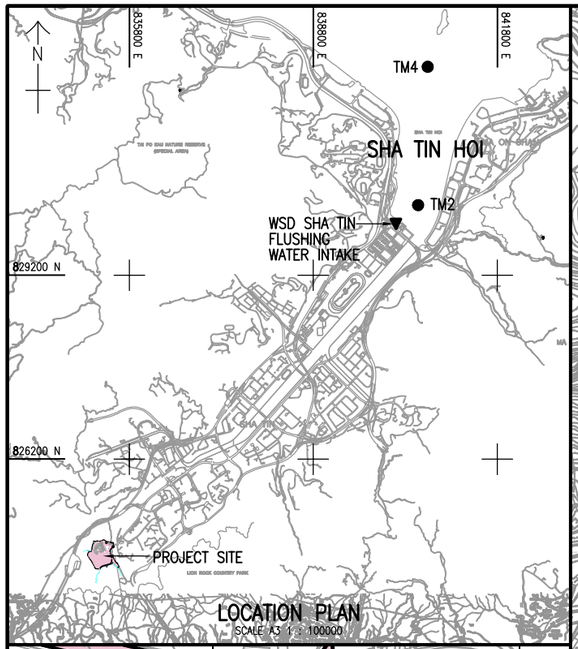
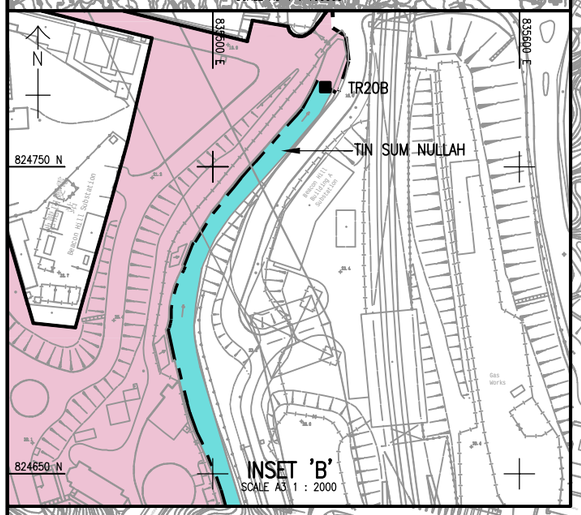


LOCATION PLAN
SCALE A3 1 : 100000



INSET 'B'
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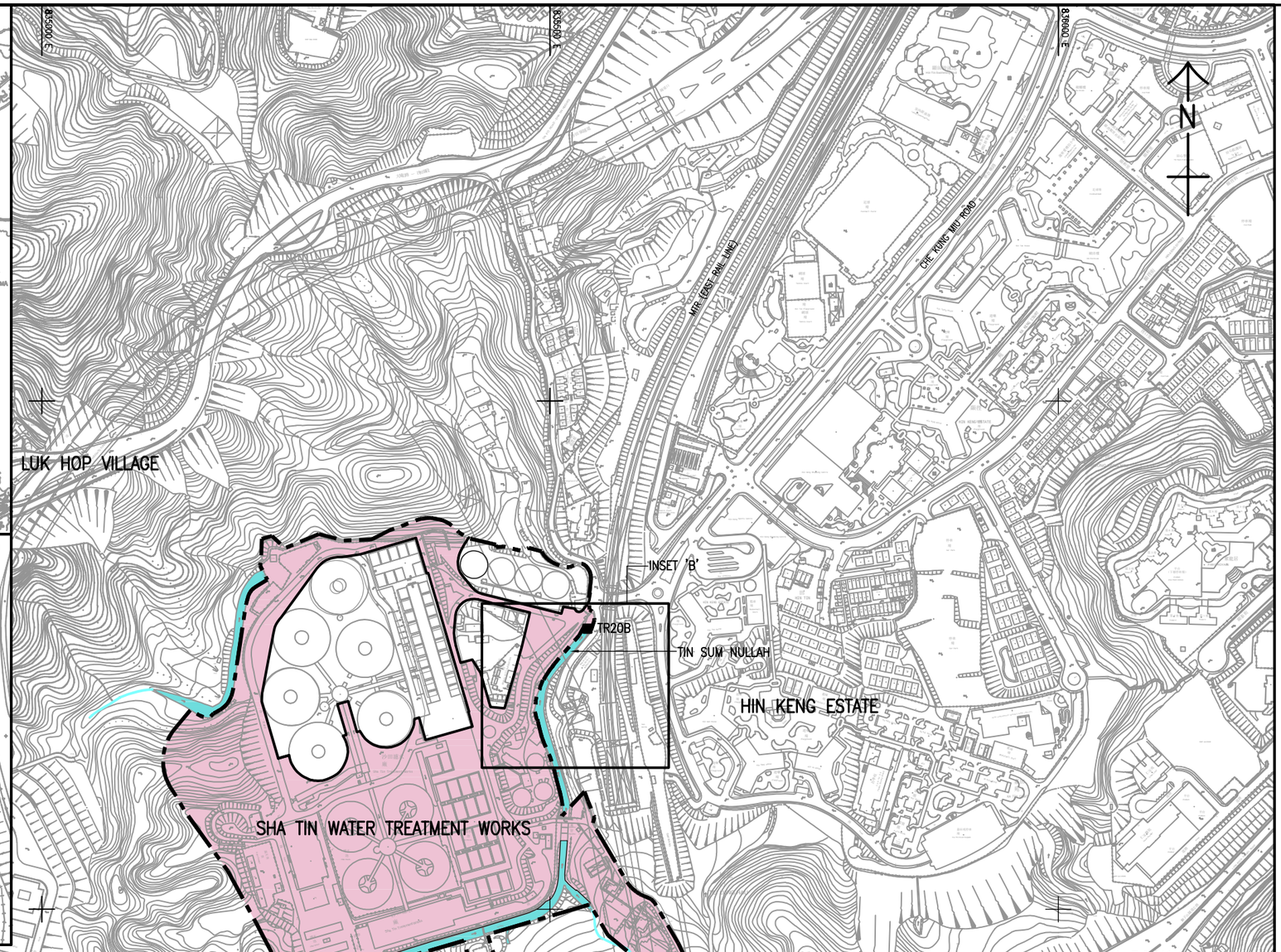

LEGEND:

- SITE BOUNDARY OF SHATIN WATER TREATMENT WORKS
- WORKS AREA
- INLAND WATER COURSE
- EPD MARINE WATER QUALITY MONITORING STATION
- EPD RIVER WATER QUALITY MONITORING STATION
- WSD SHA TIN FLUSHING WATER INTAKE

REV. 修訂	DESCRIPTION 內容摘要	DR.	P.C. CHECKED 核准	DATE 日期

水 務 署
WATER SUPPLIES DEPARTMENT

AGREEMENT NO. CE 13/2009 (WS)
IN-SITU REPROVISIONING OF SHA TIN WATER TREATMENT WORKS-SOUTH WORKS
DESIGN AND CONSTRUCTION

LOCATIONS OF WATER SENSITIVE RECEIVERS

AECOM

DRG.NO. 圖紙編號 60162073/EIA/FIG 6.1

DESIGNED BY 設計 –	CONTRACT NO. 合約編號	P. Dr. APPROVED 批准人
DRAWN BY 繪圖 DXL	STATUS 階段	
SCALE 比例 A3 1 : 5000		
DIMENSIONS ARE IN 尺寸單位 METRES		

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Appendix F
Summary of Action and Limit Levels

Determination of Action and Limit Levels for Air Quality

Monitoring Locations	Action Level 1-hour TSP, (μg/m^3)	Limit Level 1-hour TSP, (μg/m^3)
AM1	357	500
AM2	334	500

Determination of Action and Limit Levels for Noise

Monitoring Location	Action Level	Limit Level in dB(A)
	0700-1900 hours on normal weekdays	
NM1	When one documented complaint is received	For domestic premises: 75 dB(A) for NM1 & NM2
NM2		
NM3		For schools: 70dB(A) during normal teaching periods and 65 dB(A) during examination periods for NM3

Determination of Action and Limit Levels for Water Quality

Water monitoring stations	Dissolved Oxygen (mg/L)		Suspended Solids (mg/L)		Turbidity (NTU)		pH	
	Action Level	Limit Level	Action Level	Limit Level	Action Level	Limit Level	Action Level	Limit Level
C1	7.51	7.44	4.19	6.73	3.99	4.00	Beyond the range 6.6 to 7.9	Beyond the range 6.5 to 8.0
C2	8.10	7.98	4.33	8.16	3.13	3.28	Beyond the range 6.6 to 8.8	Beyond the range 6.5 to 8.9
C3*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M1	8.90	8.89	3.30	3.56	4.36	4.48	Beyond the range 6.6 to 8.2	Beyond the range 6.6 to 8.3
M2	8.92	8.91	18.84	26.80	12.64	13.72	Beyond the range 6.6 to 11.0	Beyond the range 6.6 to 11.0
M3	9.16	9.15	1.00	1.00	1.10	1.18	Beyond the range 6.6 to 8.6	Beyond the range 6.6 to 8.7

Remark: For DO, action should be taken when monitoring result of either one of the surface, middle or bottom DO is lower than the proposed Action/Limit Levels.

Appendix G
Event/Action Plan

Air Quality

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
ACTION LEVEL				
1. Exceedance for one sample	1. Inform the Contractor, IEC and ER; 2. Discuss with the Contractor on the remedial measures required; 3. Repeat measurement to confirm findings; and 4. Increase monitoring frequency.	1. Check monitoring data submitted by the ET; 2. Check Contractor's working method; and 3. Review and advise the ET and ER on the effectiveness of the proposed remedial measures.	1. Confirm receipt of notification of exceedance in writing.	1. Identify source(s), investigate the causes of exceedance and propose remedial measures; 2. Implement remedial measures; and 3. Amend working methods agreed with the ER as appropriate.
2. Exceedance for two or more consecutive samples	1. Inform the Contractor, IEC and ER; 2. Discuss with the ER and Contractor on the remedial measures required; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency to daily; 5. If exceedance continues,	1. Check monitoring data submitted by the ET; 2. Check Contractor's working method; and 3. Review and advise the ET and ER on the effectiveness of the proposed remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Review and agree on the remedial measures proposed by the Contractor; and 3. Supervise implementation of remedial measures.	1. Identify source and investigate the causes of exceedance; 2. Submit proposals for remedial measures to the ER with a copy to ET and IEC within three working days of notification; 3. Implement the agreed proposals; and

	arrange meeting with the IEC, ER and Contractor; and 6. If exceedance stops, cease additional monitoring.			4. Amend proposal as appropriate.
LIMIT LEVEL				
Event	**ET**	**IEC**	**ER**	**CONTRACTOR**
1. Exceedance for one sample	1. Inform the Contractor, IEC, EPD and ER; 2. Repeat measurement to confirm findings; 3. Increase monitoring frequency to daily; and 4. Discuss with the ER, IEC and contractor on the remedial measures and assess the effectiveness.	1. Check monitoring data submitted by the ET; 2. Check the Contractor's working method; 3. Discuss with the ET, ER and Contractor on possible remedial measures; and 4. Review and advise the ER and ET on the effectiveness of Contractor's remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Review and agree on the remedial measures proposed by the Contractor; and 3. Supervise implementation of remedial measures.	1. Identify source(s) and investigate the causes of exceedance; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial measures to ER with a copy to ET and IEC within three working days of notification; 4. Implement the agreed proposals; and 5. Amend proposal if appropriate.

	ET	IEC	ER	CONTRACTOR
2. Exceedance for two or more consecutive samples	1. Notify Contractor, IEC, EPD and ER; 2. Repeat measurement to confirm findings; 3. Increase monitoring frequency to daily; 4. Carry out analysis of the Contractor's working procedures with the ER to determine possible mitigation to be implemented; 5. Arrange meeting with the IEC and ER to discuss the remedial measures to be taken; 6. Review the effectiveness of the Contractor's remedial measures and keep IEC, EPD and ER informed of the results; and 7. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by the ET; 2. Check the Contractor's working method; 3. Discuss with ET, ER, and Contractor on the potential remedial measures; and 4. Review and advise the ER and ET on the effectiveness of Contractor's remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be implemented; 3. Supervise the implementation of remedial measures; and 4. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Identify source(s) and investigate the causes of exceedance; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial measures to the ER with a copy to the IEC and ET within three working days of notification; 4. Implement the agreed proposals; 5. Revise and resubmit proposals if problem still not under control; and 6. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Noise

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
ACTION LEVEL	1. Notify the Contractor, IEC and ER; 2. Discuss with the ER and Contractor on the remedial measures required; and 3. Increase monitoring frequency to check mitigation effectiveness.	1. Review the investigation results submitted by the Contractor; and 2. Review and advise the ET and ER on the effectiveness of the remedial measures proposed by the Contractor.	1. Confirm receipt of notification of complaint in writing; 2. Review and agree on the remedial measures proposed by the Contractor; and 3. Supervise implementation of remedial measures.	1. Investigate the complaint and propose remedial measures; 2. Report the results of investigation to the IEC, ET and ER; 3. Submit noise mitigation proposals to the ER with copy to the IEC and ET within three working days of notification; and 4. Implement noise mitigation proposals.
LIMIT LEVEL	1. Notify the Contractor, IEC, EPD and ER; 2. Repeat measurement to confirm findings; 3. Increase monitoring frequency; 4. Carry out analysis of	1. Check monitoring data submitted by the ET; 2. Check the Contractor's working method; 3. Discuss with the ER, ET and Contractor on the potential remedial measures;	1. Confirm receipt of notification of failure in writing; 2. In consultation with the ET and IEC, agree with the Contractor on the remedial measures to be	1. Identify source and investigate the causes of exceedance; 2. Take immediate action to avoid further exceedance; 3. Submit proposals for remedial measures to the ER

	Contractor's working procedures to determine possible mitigation to be implemented; 5. Arrange meeting with the IEC and ER to discuss the remedial measures to be taken; 6. Review the effectiveness of Contractor's remedial measures and keep IEC, EPD and ER informed of the results; and 7. If exceedance stops, cease	and 4. Review and advise the ET and ER on the effectiveness of the remedial measures proposed by the Contractor.	implemented; 3. Supervise the implementation of remedial measures; and 4. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	with copy to the IEC and ET within three working days of notification; 4. Implement the agreed proposals; 5. Revise and resubmit proposals if problem still not under control; and 6. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Water Quality

EVENT	ACTION			
	ET Leader	IEC	ER	CONTRACTOR
Action level being exceeded by one sampling day	● Repeat *in situ* measurement to confirm findings; ● Identify reasons for non-compliance and source(s) of impact; ● Inform IEC and Contractor; ● Check monitoring data, all plant, equipment and Contractor's working methods; ● Discuss mitigation measures with IEC and Contractor; ● Repeat measurement on next day of exceedance.	● Discuss with ET and Contractor on the mitigation measures; ● Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; ● Assess the effectiveness of the Implemented mitigation measures.	● Discuss with IEC on the proposed mitigation measures; ● Make agreement on the mitigation measures to be implemented. ● Assess the effectiveness of the implemented mitigation measures.	● Inform the ER and confirm notification of the non-compliance in writing; ● Rectify unacceptable practice; ● Check all plant and equipment; ● Consider changes of working methods; ● Discuss with ET and IEC and propose mitigation measures to IEC and ER; ● Implement the agreed mitigation measures.

	ET Leader	IEC	ER	CONTRACTOR
Action level being exceeded by more than one consecutive sampling day	● Repeat *in situ* measurement to confirm findings; ● Identify reasons for non-compliance and source(s) of impact; ● Inform IEC and Contractor; ● Check monitoring data, all plant, equipment and Contractor's working methods; ● Discuss mitigation measures with IEC and Contractor; ● Ensure mitigation measures are implemented; ● Prepare to increase the monitoring frequency to daily;	● Discuss with ET and Contractor on the mitigation measures; ● Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; ● Assess the effectiveness of the implemented mitigation measures.	● Discuss with IEC on the proposed mitigation measures; ● Make agreement on the mitigation measures to be implemented; ● Assess the effectiveness of the implemented mitigation measures.	● Inform the ER and confirm notification of the non-compliance in writing; ● Rectify unacceptable practice; ● Check all plant and equipment; ● Consider changes of working methods; ● Discuss with ET and IEC and propose mitigation measures to IEC and ER within three working days; ● Implement the agreed mitigation measures.

	• Repeat measurement on next day of exceedance.			
	ET Leader	**IEC**	**ER**	**CONTRACTOR**
Limit level being exceeded by one sampling day	• Repeat *in situ* measurement to confirm findings; • Identify reasons for non-compliance and source(s) of impact; • Inform IEC Contractor and EPD; • Check monitoring data, all plant, equipment and Contractor's working methods; • Discuss mitigation measures with IEC, ER and Contractor; • Ensure mitigation measures are implemented;	• Discuss with ET and Contractor on the mitigation measures; • Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; • Assess the effectiveness of the implemented mitigation measures.	• Discuss with IEC, ET and Contractor on the proposed mitigation measures; • Request Contractor to critically review the working methods; • Make agreement on the mitigation measures to be implemented; • Assess the effectiveness of the implemented mitigation measures.	• Inform the ER and confirm notification of the non-compliance in writing; • Rectify unacceptable practice; • Check all plant and equipment; • Consider changes of working methods; • Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within three working days; • Implement the agreed mitigation measures.

	● Increase the monitoring frequency to daily until no exceedance of Limit level.			
	ET Leader	**IEC**	**ER**	**CONTRACTOR**
Limit level being exceeded by more than one consecutive sampling day	● Repeat *in situ* measurement to confirm findings; ● Identify reasons for non-compliance and source(s) of impact; ● Inform IEC Contractor and EPD; ● Check monitoring data, all plant, equipment and Contractor's working methods; ● Discuss mitigation measures with IEC, ER and Contractor; ● Ensure mitigation measures are	● Discuss with ET and Contractor on the mitigation measures; ● Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; ● Assess the effectiveness of the implemented mitigation measures.	● Discuss with IEC, ET and Contractor on the proposed mitigation measures; ● Request Contractor to critically review the working methods; ● Make agreement on the mitigation measures to be implemented; ● Assess the effectiveness of the implemented mitigation measures; ● Consider and instruct, if necessary, the Contractor to slow	● Inform the ER and confirm notification of the non-compliance in writing; ● Rectify unacceptable practice; ● Check all plant and equipment; ● Consider changes of working methods; ● Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within three working days; ● Implement the agreed mitigation measures;

	implemented; Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days.		down or to stop all or part of the construction activities until no exceedance of Limit level.	● As directed by the ER, to slow down or to stop all or part of the construction activities.

Appendix H
Impact Monitoring Schedules

Impact Monitoring Schedule for STWTW

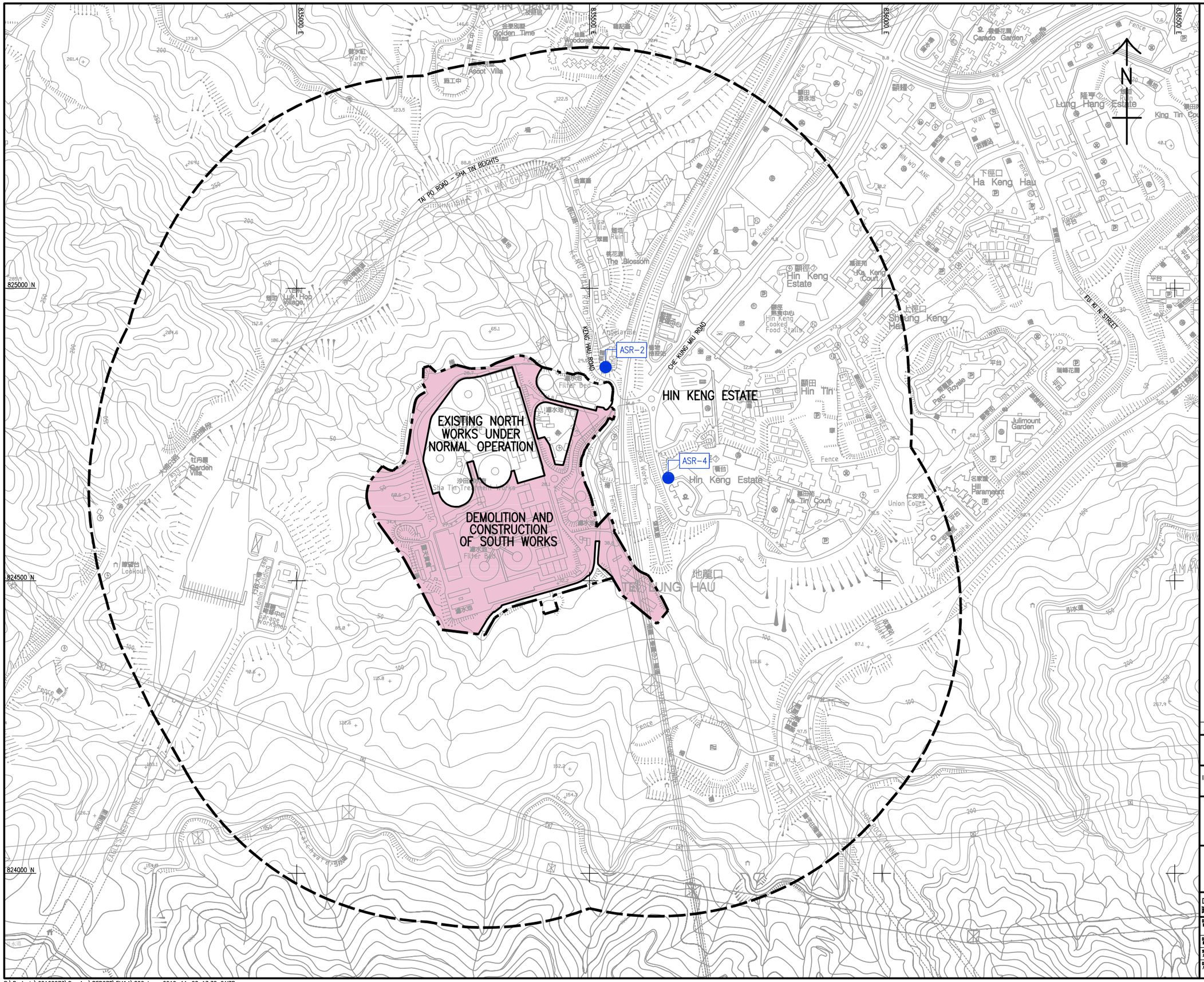
Jul 19						
Sun	Mon	Tue	Wed	Thur	Fri	Sat
	1	2 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	3	4 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	5	6 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3
7	8 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	9	10 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	11	12 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	13
14	15 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	16	17 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	18	19 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	20
21	22 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	23	24 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	25	26 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	27
28	29 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	30	31			

Impact Monitoring Schedule for STWTW

Jun-19

Sun	Mon	Tue	Wed	Thur	Fri	Sat
						1
2	3 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	4	5	6 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	7	8 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3
9	10 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	11	12 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	13	14 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	15
16	17 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	18	19 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	20	21 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	22
23	24 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	25	26 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	27	28 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	29
30						

Appendix I
Location Plan of Air Quality Monitoring Station



LEGEND:

- SITE BOUNDARY OF SHA TIN WATER TREATMENT WORKS
- STUDY AREA (500m BOUNDARY)
- WORKS AREA
- RESPRESENTATIVE AIR SENSITIVE RECEIVERS (ASRS)
- ASR-2 THE L LOUEY
- ASR-4 HIN KENG ESTATE – HIN WAN HOUSE

REV. 修訂	DESCRIPTION 內容摘要	BY 由 CHECKED 核准	DATE 日期

水 務 署
WATER SUPPLIES DEPARTMENT

AGREEMENT NO. CE 13/2009 (WS)
IN-SITU REPROVISIONING OF SHA TIN WATER TREATMENT WORKS-SOUTH WORKS
DESIGN AND CONSTRUCTION

LOCATIONS OF PROPOSED DUST MONITORING STATIONS

AECOM

DRG.NO. 圖紙編號 60162073/EM&A/FIG 3

DESIGNED BY 設計 –	CONTRACT NO. 合約編號	P. Dir. APPROVED 批准人
DRAWN BY 繪圖 NHP	STATUS 階段	
SCALE 比例 A3 1 : 6000		
DIMENSIONS ARE IN 尺寸單位 METRES	© COPYRIGHT RESERVED 版 權 所 有	

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Appendix J
Calibration Certificates
(Air Monitoring)

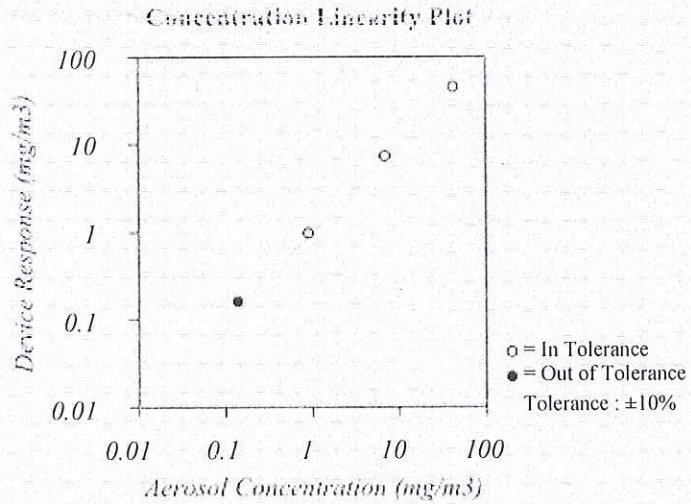
CERTIFICATE OF CALIBRATION AND TESTING

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 http://www.tsi.com

Environment Conditions		
Temperature	75.4 (24.1)	°F (°C)
Relative Humidity	29	%RH
Barometric Pressure	29.06 (984.1)	inHg (hPa)

Model	**8532**
Serial Number	**8532114409**

☐ As Left ☐ In Tolerance
☒ As Found ☒ Out of Tolerance



System ID: DTII01-02

FLOW AND PRESSURE VERIFICATION — **SYSTEM DTII01-02**

Parameter	Standard	Measured	Allowable Range	Parameter	Standard	Measured	Allowable Range
Flow lpm	3.00	2.99	2.85 ~ 3.15	Pressure kPa	98.4	98.3	93.45 ~ 103.28

Pump run time: 2551 Hours. Pump voltage: 617 Bits

TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass per standard ISO 12103-1, A1 test dust (Arizona dust). Our calibration ratio is greater than 1.2:1

Measurement Variable	System ID	Last Cal.	Cal. Due
Temp/Humidity	E005657	02-15-19	02-29-20
DC Voltage	E003314	02-25-19	02-29-20
Photometer	E003319	02-22-19	08-31-19
1 um PSL	698880	n/a	n/a
10 um PSL	198441	n/a	n/a
Flowmeter	E004025	06-06-18	06-30-19

Measurement Variable	System ID	Last Cal.	Cal. Due
Temp/Humidity	E005656	02-19-19	02-29-20
DC Voltage	E003315	02-25-19	02-29-20
Microbalance	M001324	10-03-18	10-31-20
3 um PSL	180387	n/a	n/a
Pressure	E003511	10-29-18	10-31-19

Verified

March 4, 2019
Date

TSI P/N 2300157

CERTIFICATE OF CALIBRATION AND TESTING

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 http://www.tsi.com

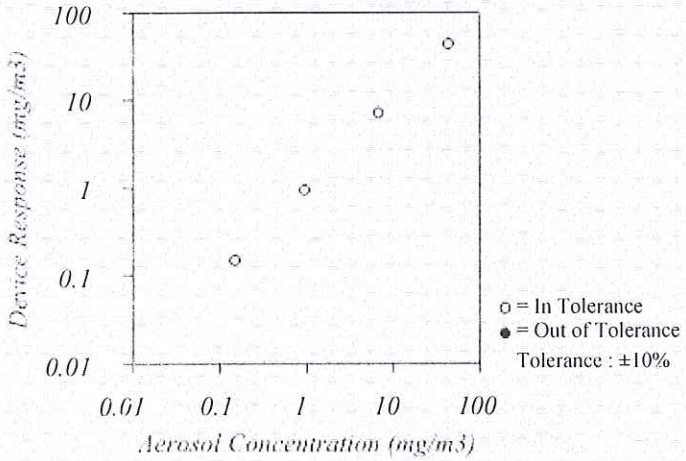
Environment Conditions		
Temperature	74.4 (23.6)	°F (°C)
Relative Humidity	31	%RH
Barometric Pressure	29.00 (982.1)	inHg (hPa)

Model	8532
Serial Number	8532114409

☒ As Left ☐ As Found

☒ In Tolerance ☐ Out of Tolerance

Concentration Linearity Plot



System ID: DTII01-02

FLOW AND PRESSURE VERIFICATION — **SYSTEM DTII01-02**

Parameter	Standard	Measured	Allowable Range	Parameter	Standard	Measured	Allowable Range
Flow lpm	3.00	3.05	2.91 ~ 3.09	Pressure kPa	98.2	98.2	93.25 ~ 103.07

TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass per standard ISO 12103-1, A1 test dust (Arizona dust). Our calibration ratio is greater than 1.2:1

Measurement Variable	System ID	Last Cal.	Cal. Due
Temp/Humidity	E005657	02-15-19	02-29-20
DC Voltage	E003314	02-25-19	02-29-20
Photometer	E003319	02-22-19	08-31-19
1 um PSL	698880	n/a	n/a
10 um PSL	198441	n/a	n/a
Flowmeter	E004025	06-06-18	06-30-19

Measurement Variable	System ID	Last Cal.	Cal. Due
Temp/Humidity	E005656	02-19-19	02-29-20
DC Voltage	E003315	02-25-19	02-29-20
Microbalance	M001324	10-03-18	10-31-20
3 um PSL	180387	n/a	n/a
Pressure	E003511	10-29-18	10-31-19

Calibrated

March 4, 2019
Date

TSI P/N 2300157

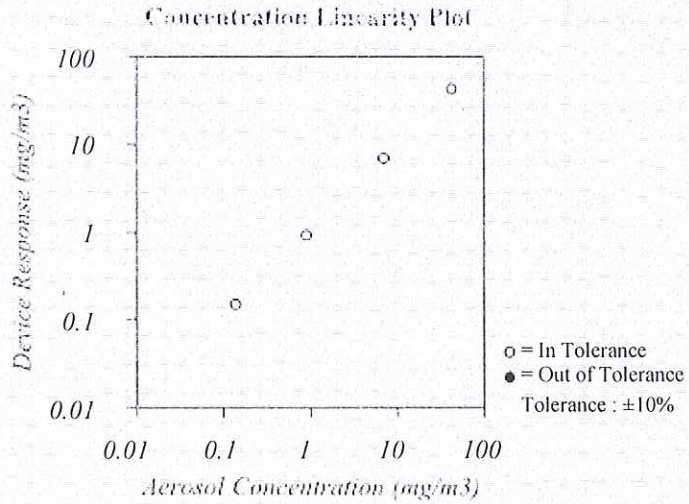
CERTIFICATE OF CALIBRATION AND TESTING

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 http://www.tsi.com

Environment Conditions		
Temperature	75.43 (24.1)	°F (°C)
Relative Humidity	28.7	%RH
Barometric Pressure	29.06 (984.1)	inHg (hPa)

Model	**8532**
Serial Number	**8532120909**

☐ As Left ☒ In Tolerance
☒ As Found ☐ Out of Tolerance



System ID: DTII01-02

FLOW AND PRESSURE VERIFICATION — **SYSTEM DTII01-02**

Parameter	Standard	Measured	Allowable Range	Parameter	Standard	Measured	Allowable Range
Flow lpm	3.00	2.97	2.85 ~ 3.15	Pressure kPa	98.4	98.3	93.48 ~ 103.32

Pump run time: 3001 Hours, Pump voltage: 617 Bits

TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass per standard ISO 12103-1, A1 test dust (Arizona dust). Our calibration ratio is greater than 1.2:1

Measurement Variable	System ID	Last Cal.	Cal. Due
Temp/Humidity	E005657	02-15-19	02-29-20
DC Voltage	E003314	02-25-19	02-29-20
Photometer	E003319	02-22-19	08-31-19
1 um PSL	698880	n/a	n/a
10 um PSL	198441	n/a	n/a
Flowmeter	E004025	06-06-18	06-30-19

Measurement Variable	System ID	Last Cal.	Cal. Due
Temp/Humidity	E005656	02-19-19	02-29-20
DC Voltage	E003315	02-25-19	02-29-20
Microbalance	M001324	10-03-18	10-31-20
3 um PSL	180387	n/a	n/a
Pressure	E003511	10-29-18	10-31-19

Verified

March 4, 2019
Date

TSI P/N 2300157

CERTIFICATE OF CALIBRATION AND TESTING

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 http://www.tsi.com

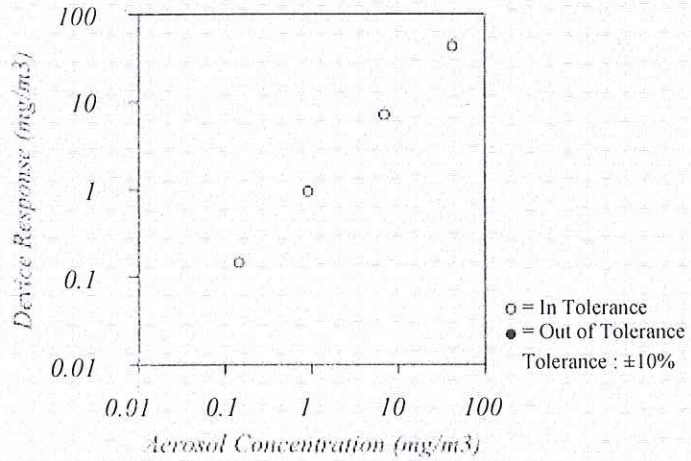
Environment Conditions		
Temperature	74.49 (23.6)	°F (°C)
Relative Humidity	28.3	%RH
Barometric Pressure	29.00 (982.1)	inHg (hPa)

Model	**8532**
Serial Number	**8532120909**

☒ As Left ☐ As Found

☒ In Tolerance ☐ Out of Tolerance

Concentration Linearity Plot



System ID: DTII01-02

FLOW AND PRESSURE VERIFICATION — **SYSTEM DTII01-02**

Parameter	Standard	Measured	Allowable Range	Parameter	Standard	Measured	Allowable Range
Flow lpm	3.00	3.05	2.91 ~ 3.09	Pressure kPa	98.2	98.2	93.31 ~ 103.13

TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass per standard ISO 12103-1, A1 test dust (Arizona dust). Our calibration ratio is greater than 1.2:1

Measurement Variable	System ID	Last Cal.	Cal. Due
Temp/Humidity	E005657	02-15-19	02-29-20
DC Voltage	E003314	02-25-19	02-29-20
Photometer	E003319	02-22-19	08-31-19
1 um PSL	698880	n/a	n/a
10 um PSL	198441	n/a	n/a
Flowmeter	E004025	06-06-18	06-30-19

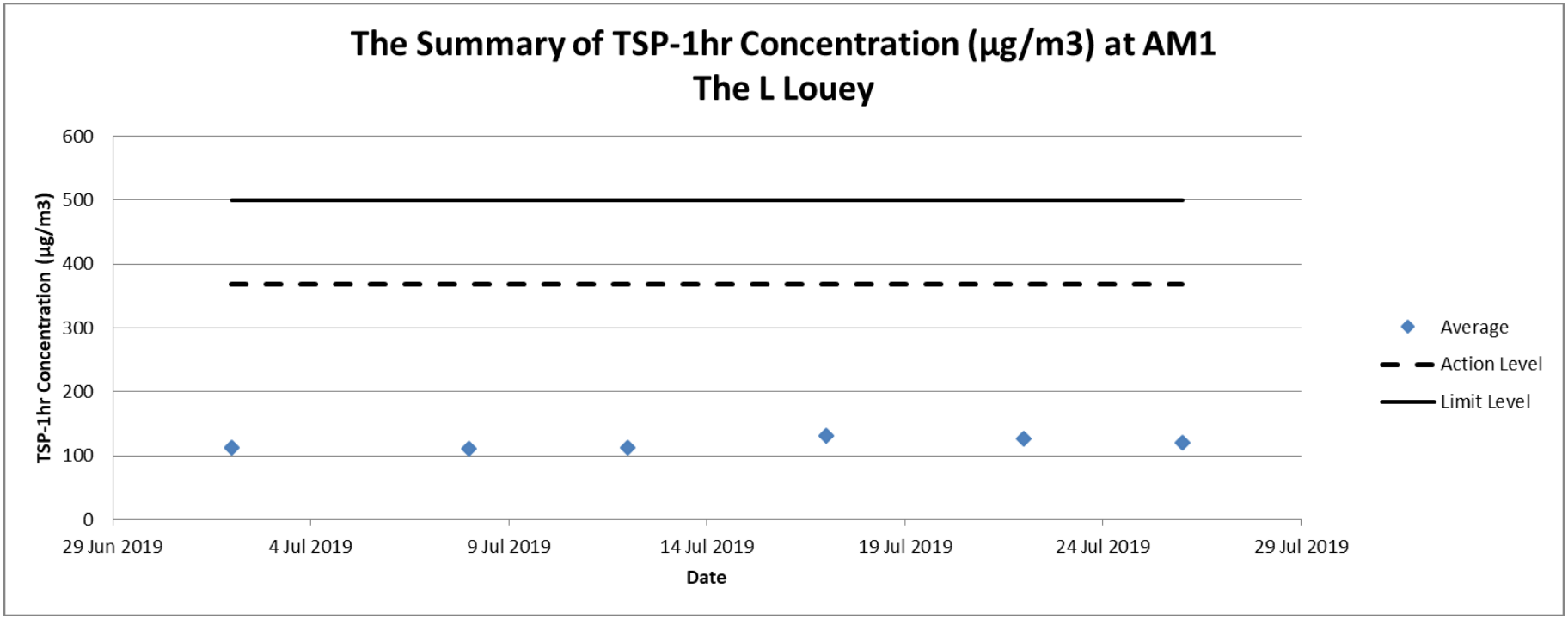
Measurement Variable	System ID	Last Cal.	Cal. Due
Temp/Humidity	E005656	02-19-19	02-29-20
DC Voltage	E003315	02-25-19	02-29-20
Microbalance	M001324	10-03-18	10-31-20
3 um PSL	180387	n/a	n/a
Pressure	E003511	10-29-18	10-31-19

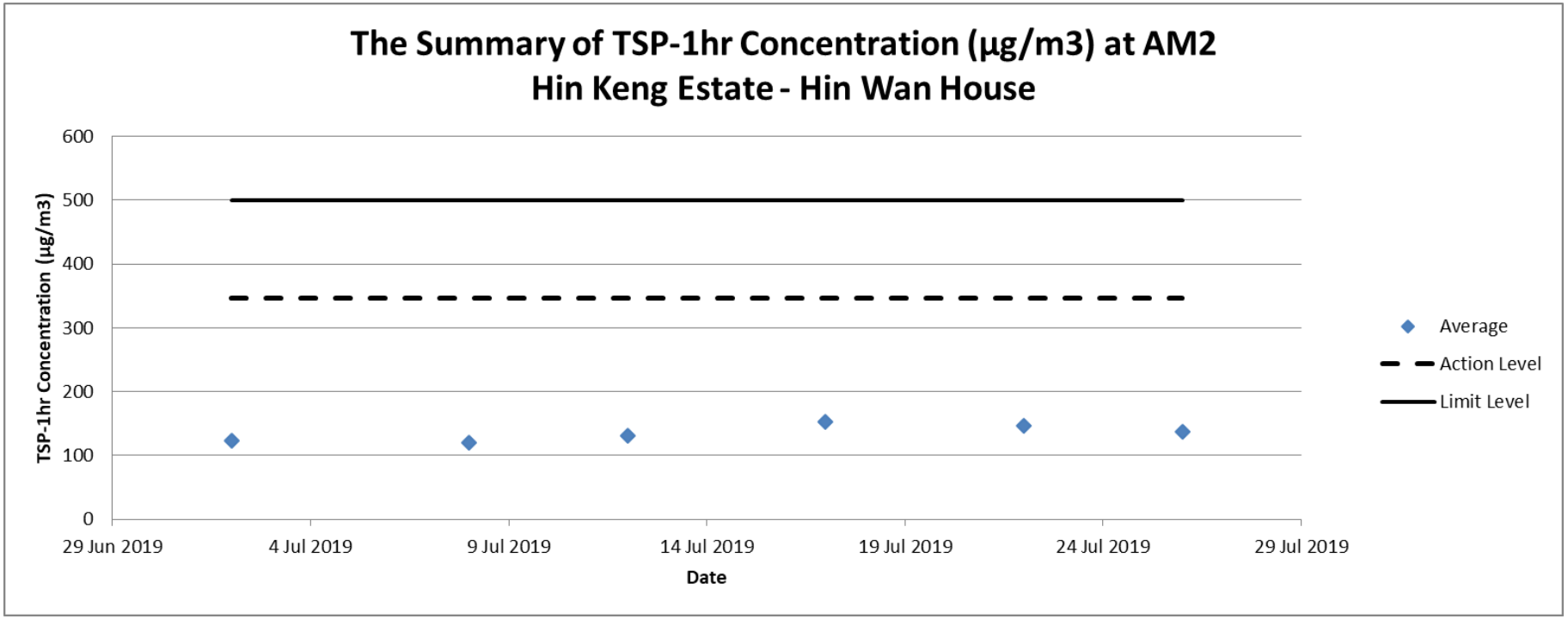
Calibrated

March 4, 2019
Date

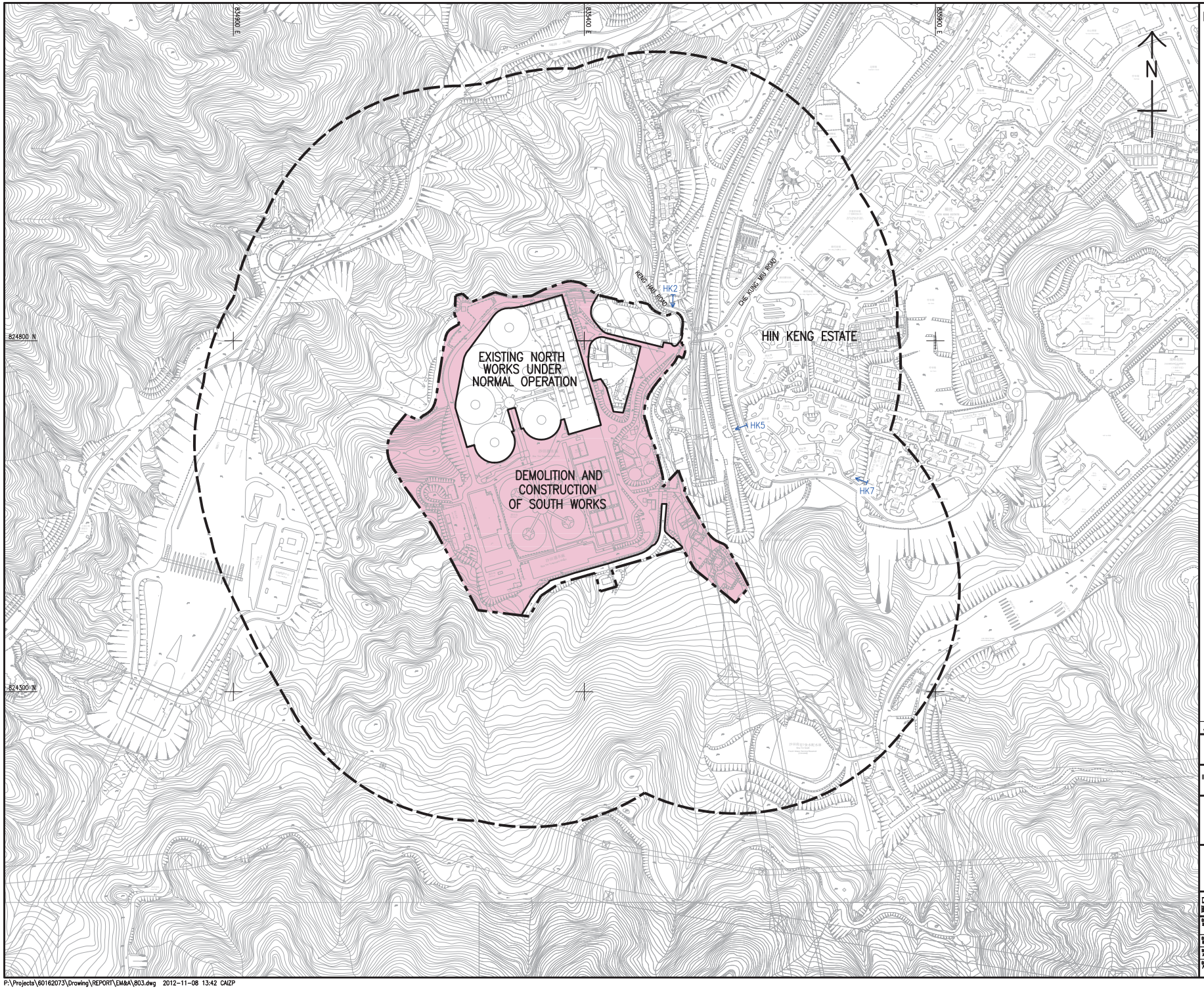
TSI P/N 2300157

Appendix K
Impact Air Quality Monitoring Results and Graphical Presentation


The Summary of TSP-1hr Concentration (µg/m3) at AM1
The L Louey
TSP-1hr Concentration (µg/m3)
600
500
400
300
200
100
0
29 Jun 2019
4 Jul 2019
9 Jul 2019
14 Jul 2019
19 Jul 2019
24 Jul 2019
29 Jul 2019
Date
Average
Action Level
Limit Level


The Summary of TSP-1hr Concentration (µg/m3) at AM2
Hin Keng Estate - Hin Wan House
TSP-1hr Concentration (µg/m3)
600
500
400
300
200
100
0
29 Jun 2019
4 Jul 2019
9 Jul 2019
14 Jul 2019
19 Jul 2019
24 Jul 2019
29 Jul 2019
Date
Average
Action Level
Limit Level

Appendix L
Location Plan of Noise Monitoring Station



LEGEND:

- SITE BOUNDARY OF SHA TIN WATER TREATMENT WORKS
- 300m STUDY AREA
- WORKS AREA
- HK2 — THE L LOUEY (SOUTH)
- HK5 — HIN KENG ESTATE – HIN WAN HOUSE
- HK7 — CUHKFAA THOMAS CHEUNG SCHOOL

REV. 修訂	DESCRIPTION 內容摘要	BY 由	CHECKED 核對	DATE 日期

水務署
WATER SUPPLIES DEPARTMENT

AGREEMENT NO. CE 13/2009 (WS)
IN-SITU REPROVISIONING OF SHA TIN WATER TREATMENT WORKS – SOUTH WORKS
DESIGN AND CONSTRUCTION

LOCATIONS OF PROPOSED NOISE MONITORING STATIONS

AECOM

DRG. NO. 圖表編號: 60162073/EM&A/FIG 4

DESIGNED BY 設計	CONTRACT NO. 合約編號	P. IN. APPROVED 批准人
DRAWN BY 繪圖 NHP	STATUS 狀況	
SCALE 比例 A3 1 : 5000		
DIMENSIONS ARE IN 尺寸單位 METRES	© COPYRIGHT RESERVED 版權所有	

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Appendix M
Calibration Certificates (Noise)

Kestrel®
Weather & Environmental Meters
by NK

Certificate of Conformity

This instrument was produced under rigorous factory production control and documented standard procedures. It was individually visually inspected, leak tested and function tested for display, backlight, button and software performance. The accuracy of each of its primary measurements was individually calibrated and/or tested against standards traceable to the National Institute of Standards and Technology ("NIST") or calibrated intermediary standards. This instrument is certified to have performed at the time of manufacture in compliance with the following specifications as they apply to this meter's specific model, measurements and features.

Methods Used in Calibration and Testing

Wind Speed:

The Kestrel Pocket Weather Meter impeller installed in this unit was individually tested in a subsonic wind tunnel operating at approximately 300 fpm (1.5 m/s) and 1200 fpm (6.1 m/s) monitored by a Gill Instruments Model 1350 ultrasonic time-of-flight anemometer. The Standard's maximum combined uncertainty is +/–1.04% within the airspeed range 706.6 to 3923.9 fpm (3.59 to 19.93 m/s), and +/–1.66% within the airspeed range 166.6 to 706.6 fpm (0.85 to 3.59 m/s).

Temperature:

Temperature response is verified in comparison with a Eutechnics 4600 Precision Thermometer or a standard Kestrel 4000 Weather and Environmental Meter calibrated weekly against the Eutechnics 4600. The Eutechnics 4600 is calibrated annually and is traceable to NIST with a system accuracy of +/– 0.05 °C.

Direction / Heading

The sensitivity of the magnetic directional sensor is verfied at the component level by applying a magnetic field to the sensor and measuring the signal output at 4 points, as well as after assembly by orienting the unit to the cardinal directions and measuring the magnetic field output. In both cases the compass output must be accurate to within +/– 5 degrees.

Relative Humidity:

Relative humidity receives a two-point calibration in humidity and temperature controlled chambers at 75.3% RH and 32.8% RH at 25° C. The calibration tanks are monitored with an Edgetech Model 2002 DewPrime II Standard Chilled Mirror Hygrometer. Following calibration, performance is further verified at an RH of approximately 43.2% against the Edgetech Hygrometer. The Edgetech Hygrometer is calibrated annually and is traceable to NIST with a maximum relative expanded uncertainty of +/– 0.2% RH.

Barometric Pressure:

Pressure response is verified against a Mensor Series 6000 Digital Barometer or a standard Kestrel 4000 Weather and Environmental Meter calibrated weekly against the Mensor Barometer. The Mensor Barometer is calibrated annually and is traceable to NIST with a maximum relative expanded uncertainty of +/– 0.02% F.S.

Approved By:

Michael Naughton, Engineering Manager

The enclosed Kestrel Weather and Environmental Meter was manufactured by Nielsen-Kellerman Co. at its facilities located at 21 Creek Circle, Boothwyn, PA 19061 USA.

SENSORS

SENSOR	1000	2000	2500	3000	3500	3500 DT	4000	4200	4250	4300	4400	4500	4500 HOR	ACCURACY (+/-)*	RESOLUTION	SPECIFICATION RANGE	OPERATIONAL RANGE	NOTES
Wind Speed | Air Flow	•	•	•	•	•	•	•	•	•	•	•	•	•	Larger of 3% of reading, least significant digit or 20 ft/min	0.1 m/s 1 ft/min 0.1 km/h 0.1 mph 0.1 knots 1 B	0.6 to 40.0 m/s 118 to 7,874 ft/min 2.2 to 144.0 km/h 1.3 to 89.5 mph 1.2 to 77.8 knots 0 to 12 B	0.6 to 60.0 m/s 118 to 11,811 ft/min 2.2 to 216.0 km/h 1.3 to 134.2 mph 1.2 to 116.6 knots 0 to 12 B	1 inch|25 mm diameter impeller with precision axle and low-friction Zytel® bearings. Startup speed stated as lower limit, readings may be taken down to 0.4 m/s | 79 ft/min | 1.5 km/h | .9 mph | .8 kt after impeller startup. Off-axis accuracy -1% @ 5° off-axis; -2% @ 10°; -3% @ 15°. Calibration drift < 1% after 100 hours use at 16 MPH | 7 m/s. Replacement impeller (NK PN-0801) field installs without tools. (US Patent 5,783,753). Wind speed calibration and testing should be done with triangle on impeller located at the top front face of the Kestrel.
Ambient Temperature		•	•	•	•	•	•	•	•	•	•	•	•	0.9 °F 0.5 °C	0.1 °F 0.1 °C	-20.0 to 158.0 °F -29.0 to 70.0 °C	14.0 to 131.0 °F -10.0 to 55.0 °C	Hermetically-sealed, precision thermistor mounted externally and thermally isolated (US Patent 5,939,645) for rapid response. Airflow of 2.2 mph|1 m/s or greater provides fastest response and reduction of insolation effect. Calibration drift negligible. Thermistor may also be used to measure temperature of water or snow by submerging thermistor portion into material -- remove impeller prior to taking submerged measurements and ensure humidity sensor membrane is free of liquid water prior to taking humidity based measurements after submersion.
Globe Temperature - Tg											•			°F 1.4 °C	0.1 °F 0.1 °C	-20.0 to 140.0 °F -29.0 to 60.0 °C	14.0 to 131.0 °F -10.0 to 55.0 °C	Temperature inside 1in|25 mm black powder coated copper globe converted to Tg equivalent for standard 6 in|150 mm globe. Closest equivalence obtained with airflow greater than 2.2 mph|1 m/s.
Relative Humidity				•	•	•	•	•	•	•	•	•	•	3.0 %RH	0.1 %RH	5 to 95% non-condensing	0 to 100%	Polymer capacitive humidity sensor mounted in thin-walled chamber external to case for rapid, accurate response (US Patent 6,257,074). To achieve stated accuracy, unit must be permitted to equilibrate to external temperature when exposed to large, rapid temperature changes and be kept out of direct sunlight. Calibration drift +/- 2% over 24 months. Humidity sensor may be recalibrated at factory or in field using Kestrel Humidity Calibration Kit (NK PN-0802).
Pressure				•			•	•	•	•	•	•	•	inHg 0.03 1.0 hPa|mbar 0.01 PSI	0.01 inHg 0.1 hPa|mbar 0.01 PSI	8.86 to 32.49 inHg 300.0 to 1100.0 hPa|mbar 4.35 to 15.95 PSI *and* 32.0 to 185.0 °F 0.0 to 85.0 °C	0.30 to 48.87 inHg 10.0 to 1654.7 hPa|mbar 0.14 to 24.00 PSI *and* 14.0 to 131.0 °F -10.0 to 55.0 °C	Monolithic silicon piezoresistive pressure sensor with second-order temperature correction. Pressure sensor may be recalibrated at factory or in field. Adjustable reference altitude allows display of station pressure or barometric pressure corrected to MSL. Kestrel 4200 displays station pressure on a dedicated screen. Kestrel 2500 and 3500 display continuously updating three-hour barometric pressure trend indicator: rising rapidly, rising, steady, falling, falling rapidly. Kestrel 4000 series displays pressure trend through graphing function. PSI display on Kestrel 4000 series only.
Compass												•	•	5°	1° 1/16th Cardinal Scale	0 to 360°	0 to 360°	2-axis solid-state magnetoresistive sensor mounted perpendicular to unit plane. Accuracy of sensor dependent upon unit's vertical position. Self-calibration routine eliminates magnetic error from batteries or unit and must be run after every full power-down (battery removal or change). Readout indicates direction to which the back of the unit is pointed when held in a vertical orientation. Declination/variation adjustable for True North readout.

CALCULATED MEASUREMENTS

MEASUREMENT	1000	2000	2500	3000	3500	3500 DT	4000	4200	4250	4300	4400	4500	4500 HOR	ACCURACY (+/-)*	RESOLUTION	SPECIFICATION RANGE	SENSORS EMPLOYED	NOTES
Air Density								•	•					0.0002 lb/ft³ 0.0033 kg/m³	0.001 lbs/ft³ 0.001 kg/m³	Refer to Ranges for Sensors Employed	Temperature Relative Humidity Pressure	Mass of air per unit volume
Air Flow								•						6.71%	1 cfm 1 m³/hr 1 m³/m 0.1m³/s 1 L/s	Refer to Ranges for Sensors Employed	Air Flow User Input (Duct Shape & Size)	Volume of air flowing through an opening. Automatically calculated from Air Velocity measurement and user-specified duct shape (circle or rectangle) and dimensions (units: in, ft, cm or m). Maximum duct dimension input: 258.0 in | 21.5 ft | 655.3 cm | 6.55 m.
Altitude			•		•	•	•	•	•	•	•	•	•	typical: 23.6 ft 7.2 m max: 48.2 ft 14.7 m	1 ft 1 m	typical: 750 to 1100 mBar max: 300 to 750 mBar	Pressure User Input (Reference Pressure)	Height above Mean Sea Level ("MSL"). Temperature compensated pressure (barometric) altimeter requires accurate reference barometric pressure to produce maximum absolute accuracy. Both accuracy specs corresponds to a reference pressure anywhere from 850 to 1100 mBar.
Barometric Pressure			•		•	•	•	•	•	•	•	•	•	0.07 inHg 2.4 hPa|mbar 0.03 PSI	0.01 inHg 0.1 hPa|mbar 0.01 PSI	Refer to Ranges for Sensors Employed	Pressure User Input (Reference Altitude)	Air pressure that would be present in identical conditions at MSL. Station pressure compensated for local elevation provided by reference altitude. Requires accurate reference altitude to produce maximum absolute accuracy.
Crosswind & Headwind/Tailwind												•	•	7.1%	1 mph 1 ft/min 0.1 km/h 0.1 m/s 0.1 knots	Refer to Ranges for Sensors Employed	Wind Speed Compass	Effective wind relative to a target or travel direction. Auto-switching headwind/tailwind indication.
Delta T						•								3.2 °F 1.8 °C	0.1 °F 0.1 °C	Refer to Ranges for Sensors Employed	Temperature Relative Humidity Pressure	Difference between dry bulb temperature and wet bulb temperature. When spraying, indicates evaporation rate and droplet lifetime. Safe range for pesticide spraying is 4 to 16 °F / 2 to 9 °C.
Density Altitude							•	•	•	•	•	•	•	226 ft 69 m	1 ft 1 m	Refer to Ranges for Sensors Employed	Temperature Relative Humidity Pressure	Local air density converted to equivalent elevation above sea level in a uniform layer consisting of the International Standard Atmosphere.
Dewpoint				•	•	•	•	•	•	•	•	•	•	3.4 °F 1.9 °C	0.1 °F 0.1 °C	15 to 95 % RH Refer to Range for Temperature Sensor	Temperature Relative Humidity	Temperature that a volume of air must be cooled to at constant pressure for the water vapor present to condense into dew and form on a solid surface. Can also be considered to be the water-to-air saturation temperature.
Evaporation Rate										•				0.01 lb/ft²/hr 0.06 kg/m2/hr	0.01 lb/ft²/hr 0.01 kg/m²/hr	Refer to Ranges for Sensors Employed	Wind Speed Temperature Relative Humidity Pressure User Input (Concrete Temperature)	The rate at which moisture is lost from the surface of curing concrete. Requires user measurement and entry of concrete temperature obtained with an accurate IR or probe thermometer (°F or °C, not included). Readings should be taken 20 inches above pour surface with the thermistor shaded, and averaged for 6-10 seconds using built-in averaging function.
Heat Index			•	•	•		•	•	•	•	•	•	•	7.1 °F 4.0 °C	0.1 °F 0.1 °C	Refer to Ranges for Sensors Employed	Temperature Relative Humidity	Perceived temperature resulting from the combined effect of temperature and relative humidity. Calculated based on NWS Heat Index (HI) tables. Measurement range limited by extent of published tables.
Moisture Content | Humidity Ratio ("Grains")								•	•					3 gpp .04 g/kg	0.1 gpp 0.01 g/kg	Refer to Ranges for Sensors Employed	Temperature Relative Humidity Pressure	Mass of water vapor in a mass of air.
Relative Air Density									•					0.3%	0.1%	Refer to Ranges for Sensors Employed	Temperature Relative Humidity Pressure	The ratio, expressed as a percentage, of measured air density to the air density of a standard atmosphere as defined by the ICAO.
Thermal Work Limit (TWL)											•			10.9 W/m²	0.1 W/m²	Refer to Ranges for Sensors Employed	Wind Speed Temperature Globe Temperature Relative Humidity Pressure	Estimated safe maximum continuously sustainable human metabolic rate (W/m2) for the conditions and clothing factors. Based off of estimated metabolic output of typical human. On-screen zone warnings.
Outdoor Wet Bulb Globe Temperature (WBGT)											•			1.3 °F 0.7 °C	0.1 °F 0.1 °C	Refer to Ranges for Sensors Employed	Wind Speed Temperature Globe Temperature Relative Humidity Pressure	Measure of human heat stress defined as the combination of effects due to radiation, convection, and conduction. Outdoor WBGT is calculated from a weighted sum of natural wet bulb (Tnwb), globe temperature (Tg), and dry bulb temperature (Td). User settable on-screen warning zones.
Wet Bulb Temperature - Naturally Aspirated (Tnwb)											•			1.4 °F 0.8 °C	0.1 °F 0.1 °C	Refer to Ranges for Sensors Employed	Wind Speed Temperature Globe Temperature Relative Humidity Pressure	Similar to psychrometric wet-bulb temperature (see below). However, Tnwb only undergoes forced convection from the ambient air velocity. Tnwb is a measure of the evaporative cooling that the air will allow. This is accounted for by combining the effects of, mainly, relative humidity and windspeed.
Wet Bulb Temperature - Psychrometric					•	•	•	•	•	•	•	•	•	3.2 °F 1.8 °C	0.1 °F 0.1 °C	Refer to Ranges for Sensors Employed	Temperature Relative Humidity Pressure	Temperature indicated by a sling psychrometer. Due to nature of the psychrometric ratio for a water-air system, this approximates the thermodynamic wet-bulb temperature. The thermodynamic wet-bulb temperature is the temperature a parcel of air would have if cooled adiabatically to saturation temperature via water evaporating into it.
Wind Chill		•	•	•	•		•	•	•	•	•	•	•	1.6 °F 0.9 °C	0.1 °F 0.1 °C	Refer to Ranges for Sensors Employed	Wind Speed Temperature	Perceived temperature resulting from combined effect of wind speed and temperature. Calculated based on the NWS Wind Chill Temperature (WCT) Index, revised 2001, with wind speed adjusted by a factor of 1.5 to yield equivalent results to wind speed measured at 10 m above ground. Measurement range limited by extent of published tables.

ADDITIONAL SPECIFICATIONS

Display & Backlight	•	•		•										Reflective 3 1/2 digit LCD. Digit height 0.55 in / 9 mm. Aviation green electroluminescent backlight. Manual activation with auto-off.
			•		•	•								Reflective 5 digit LCD. Digit height 0.36 in / 9 mm. Choice of aviation green or visible red (NV models only) electroluminescent backlight. Manual activation with auto-off.
Response Time & Display Update							•	•	•	•	•	•	•	Multifunction, multi-digit monochrome dot-matrix display. Choice of aviation green or visible red (NV models only) electroluminescent backlight. Automatic or manual activation.
	•	•	•	•	•	•	•	•	•	•	•	•	•	All measurements except those based on relative humidity respond accurately within 1 second. Relative humidity and all measurements which include RH in their calculation may require as long as 1 minute to fully equilibrate to a large change in the measurement environment. Display updates every 1 second.
	•	•	•	•	•	•								One-button clear and restart of Max Wind Gust and Average Wind measurement.
Max/Avg Wind							•	•	•	•	•	•	•	Max and average wind calculation may be started and stopped independently of data logging of other values, along with all other wind-related functions: air velocity, crosswind, headwind/tailwind, wind chill, WBGT, TWL, evaporation rate.
Data Storage & Graphical Display, Min/Max/Avg History							4000 points	3200 points	3200 points	3600 points	2300 points	2900 points	2500 points	Minimum, maximum, average and logged history stored and displayed for every measured value. Large capacity data logger with graphical display. Manual and auto data storage. Min/Max/Avg history may be reset independently. Auto-store interval settable from 2 seconds to 12 hours, overwrite on or off. Logs even when display off except for 2 and 5 second intervals (code version 4.18 and later). Data capacity shown.
Data Upload & Bluetooth® Data Connect Option							•	•	•	•	•	•	•	Requires optional PC interface (USB or RS-232) or Bluetooth data transfer option and provided software. **Bluetooth Data Transfer Option:** Adjustable power consumption and radio range from up to 30 ft | 9 meters. Individual unit ID and 4-digit PIN code preprogrammed for easy identification and data security when pairing and transmitting. Employs Bluetooth Serial Port Protocol for data transmission.
Clock / Calendar	•	•	•	•	•	•								Requires optional PC interface (USB or RS-232) or Bluetooth data transfer option and provided software.
							•	•	•	•	•	•	•	Requires optional PC interface (USB or RS-232) or Bluetooth data transfer option and provided software.
Auto Shutdown	•	•	•	•	•	•								Requires optional PC interface (USB or RS-232) or Bluetooth data transfer option and provided software.
							•	•	•	•	•	•	•	Requires optional PC interface (USB or RS-232) or Bluetooth data transfer option and provided software.
Languages							•	•	•	•	•	•	•	English, French, German, Italian, Spanish.
Certifications	•	•	•	•	•	•	•	•	•	•	•	•	•	CE certified, RoHS and WEEE compliant. Individually tested to NIST-traceable standards (written certificate of tests available at additional charge).
Origin	•	•	•	•	•	•	•	•	•	•	•	•	•	Designed and manufactured in the USA from US and imported components. Complies with Regional Value Content and Tariff Code Transformation requirements for NAFTA Preference Criterion B.
Battery Life	•	•	•	•	•	•								CR2032, one, included. Average life, 300 hours. Battery life reduced by backlight use in 2000 to 3500 models.
							•	•	•	•	•	•	•	**Standard Models:** AAA Alkaline, two, included. Average life, 400 hours of use, reduced by backlight or Bluetooth radio transmission use.
Shock Resistance	•	•	•	•	•	•	•	•	•	•	•	•	•	MIL-STD-810g, Transit Shock, Method 516.5 Procedure IV; unit only; impact may damage replaceable impeller.
Sealing	•	•	•	•	•	•	•	•	•	•	•	•	•	Waterproof (IP67 and NEMA-6).
Operational Temperature Limits	•	•	•	•	•	•	•	•	•	•	•	•	•	14° F to 131° F | -10 °C to 55 °C. Measurements may be taken beyond the limits of the operational temperature range of the display and batteries by maintaining the unit within the operational range and exposing it to the more extreme environment for the minimum time necessary to take reading.
Storage Temperature	•	•	•	•	•	•	•	•	•	•	•	•	•	-22.0 °F to 140.0 °F | -30.0 °C to 60.0 °C
Size & Weight	•	•	•	•	•	•								4.8 x 1.9 x 1.1 in / 12.2 x 4.8 x 2.8 cm, 3.6 oz / 102 g (including slip-on cover).
							•	•	•	•		•	•	5.0 x 1.8 x 1.1 in / 12.7 x 4.5 x 2.8 cm, 3.6 oz / 102 g.
											•			6.5 x 2.3 x 1.1 in / 16.5 x 5.9 x 2.8 cm, 4.4 oz / 125 g.

* NOTE. Accuracy calculated as uncertainty of the measurement derived from statistical analysis considering the comined effects from primary sensor specifications, circuit conversions, and all other sources of error using a coverage factor of k=2, or two standard deviations (2Σ).

Please note, these specifications are valid for all Kestrel 4400 products and all other Kestrel 4000 series with a serial number higher than 659340. If your product has a lower serial number, please reference the previous version of the specifications.

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CALIBRATION CERTIFICATE

Certificate Information

Date of Issue	11-Sep-2018	**Certificate Number**	MLCN182167S

Customer Information

Company Name	Acuity Sustainability Consulting Limited
Address	Unit 1908, Nos. 301-305 Castle Peak Road, Kwai Chung, N.T.

Equipment-under-Test (EUT)

Description	Sound Level Calibrator
Manufacturer	Rion
Model Number	NC-74
Serial Number	34615222
Equipment Number	--

Calibration Particular

Date of Calibration	11-Sep-2018		
Calibration Equipment	4231(MLTE008) / AV180068 / 13-May-20 1357(MLTE190) / MLEC18/05/02 / 25-May-19		
Calibration Procedure	MLCG00, MLCG15		
Calibration Conditions	Laboratory	Temperature	23 °C ± 5 °C
		Relative Humidity	55% ± 25%
	EUT	Stabilizing Time	Over 3 hours
		Warm-up Time	Not applicable
		Power Supply	Internal battery
Calibration Results	Calibration data were detailed in the continuation pages. Calibration result was out of EUT specification.		

Approved By & Date

K.O. Lo 11-Sep-2018

Statements

* Calibration equipment used for this calibration are traceable to national / international standards.
* The results on this Calibration Certificate only relate to the values measured at the time of the calibration and the uncertainties quoted will not include allowance for the EUT long term drift, variation with environmental changes, vibration and shock during transportation, overloading, mishandling, misuse, and the capacity of any other laboratory to repeat the measurement.
* MaxLab Calibration Centre Limited shall not be liable for any loss or damage resulting from the use of the EUT.
* The copy of this Certificate is owned by MaxLab Calibration Centre Limited. No part of this Certificate may be reproduced without the prior written approval of MaxLab Calibration Centre Limited.

萬儀校正中心有限公司
MaxLab Calibration Centre Limited
香港新界葵涌華星街 16-18 號保盈工業大廈 9 樓 B2 室
Unit B2, 9/F., Boldwin Industrial Bldg., 16-18 Wah Sing Street, Kwai Chung, N.T., Hong Kong Tel: (852) 2116 1380 Fax: (852) 2264 6480 Email: info@maxlab.com.hk

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Certificate No. MLCN182167S

Calibration Data				
EUT Setting	**Standard Reading**	**EUT Error from Setting**	**Calibration Uncertainty**	**EUT Specification**
94 dB	93.9 dB	-0.1 dB	0.20 dB	± 0.3 dB

- END -

Calibrated By : Dan
Date : 11-Sep-18

Checked By : K.O. Lo
Date : 11-Sep-18

萬儀校正中心有限公司
MaxLab Calibration Centre Limited
香港新界葵涌華星街 16-18 號保盈工業大廈 9 樓 B2 室
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Certificate of Calibration

for

Description:	***Sound Level Meter***
Manufacturer:	***NTi Audio***
Type No.:	***XL2 (Serial No.: A2A-09696-E0)***
Microphone & Preamplifier:	***NTi Audio MA220 (Serial No.: 5235)***

Submitted by:

Customer:	*Acumen Environmental Engineering and Technologies Co. Ltd.*
Address:	*No.12, Tam Kon Shan Road, Tsing Yi Island, Hong Kong*

Upon receipt for calibration, the instrument was found to be:

☑ **Within**
☐ **Outside**

the allowable tolerance.

The test equipment used for calibration are traceable to National Standards via:
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory

Date of receipt: 28 February 2019

Date of calibration: 28 February 2019

Calibrated by: _____
Calibration Technician

Certified by: _____
Mr. Ng Yan Wa
Laboratory Manager

Date of issue: 28 February 2019

Room 422,Leader Industrial Centre,57-59 Au Pui Wan Street ,Fo Tan, Shatin,N.T.,Hong Kong
Tel: (852) 2668 3423 Fax:(852) 2668 6946
Homepage: http://www.aa-lab.com E-mail : inquiry@aa-lab.com

1. *Calibration Precaution:*

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours, and switched on to warm up for over 10 minutes before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.

2. *Calibration Conditions:*

Air Temperature:	24.5 °C
Air Pressure:	1008 hPa
Relative Humidity:	62.3 %

3. *Calibration Equipment:*

	Type	Serial No.	Calibration Report Number	Traceable to
Multifunction Calibrator	B&K 4226	2288467	AV180064	HOKLAS

4. *Calibration Results*

Sound Pressure Level

Reference Sound Pressure Level

Setting of Unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz		
30-130	dBA SPL	Fast	94	1000	94.0	±0.4

Linearity

Setting of Unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz		
30-130	dBA SPL	Fast	94	1000	94.0	Ref
			104		104.0	±0.3
			114		114.0	±0.3

Time Weighting

Setting of Unit-under-test (UUT)			Applied value		UUT Reading, dB	IEC 61672 Class 1 Specification, dB
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz		
30-130	dBA SPL	Fast	94	1000	94.0	Ref
		Slow			94.0	±0.3

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Frequency Response

Linear Response

Setting of Unit-under-test (UUT)			Applied value		UUT Reading,	IEC 61672 Class 1
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB
30-130	dB SPL	Fast	94	31.5	94.0	±2.0
				63	94.1	±1.5
				125	94.1	±1.5
				250	94.1	±1.4
				500	94.0	±1.4
				1000	94.0	Ref
				2000	93.8	±1.6
				4000	93.6	±1.6
				8000	93.7	+2.1; -3.1

A-weighting

Setting of Unit-under-test (UUT)			Applied value		UUT Reading,	IEC 61672 Class 1
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB
30-130	dBA SPL	Fast	94	31.5	54.6	-39.4 ±2.0
				63	67.9	-26.2 ±1.5
				125	78.1	-16.1 ±1.5
				250	85.5	-8.6 ±1.4
				500	90.8	-3.2 ±1.4
				1000	94.0	Ref
				2000	95.0	+1.2 ±1.6
				4000	94.6	+1.0 ±1.6
				8000	92.7	-1.1 +2.1; -3.1

C-weighting

Setting of Unit-under-test (UUT)			Applied value		UUT Reading,	IEC 61672 Class 1
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB
30-130	dBC SPL	Fast	94	31.5	91.0	-3.0 ±2.0
				63	93.3	-0.8 ±1.5
				125	94.0	-0.2 ±1.5
				250	94.1	-0.0 ±1.4
				500	94.1	-0.0 ±1.4
				1000	94.0	Ref
				2000	93.7	-0.2 ±1.6
				4000	92.8	-0.8 ±1.6
				8000	90.7	-3.0 +2.1; -3.1

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5. *Calibration Results Applied*

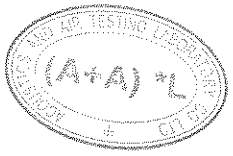
The results apply to the particular unit-under-test only. All calibration points are within manufacture's specification as IEC 61672 Class 1.

Uncertainties of Applied Value:

94 dB	31.5 Hz	± 0.05
	63 Hz	± 0.05
	125 Hz	± 0.05
	250 Hz	± 0.05
	500 Hz	± 0.05
	1000 Hz	± 0.05
	2000 Hz	± 0.05
	4000 Hz	± 0.05
	8000 Hz	± 0.10
104 dB	1000 Hz	± 0.05
114 dB	1000 Hz	± 0.05

The uncertainties are evaluated for a 95% confidence level.

Note:
The values given in this certification only related to the values measured at the time of the calibration and any uncertainties quoted will not allow for the equipment long-term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the calibration. (A+A)*L shall not be liable for any loss or damage resulting from the use of the equipment.



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(A+A)*L Acoustics and Air Testing Laboratory Co. Ltd.
聲學及空氣測試實驗室有限公司

Transmittal

To (Company):	**Acumen Environmental Engineering and Technologies Co. Ltd.**	**Date:**	1 March 2019
Address:	No.12, Tam Kon Shan Road,	**Our Ref.:**	APJ18-181-TT001
	Tsing Yi Island, Hong Kong	**Your Ref.:**	--
		Tel. No.:	6113-2368 / 2333-6823
		Project No.:	APJ18-181
Re:	Calibration of Sound Level Meter		
Attn.:	Mr. Vega Wong		
From:	Acoustics & Air Testing Lab. Co. Ltd.		

☑ **For your reference**
☐ **Return after action**
☐ **As requested**

☑ **For your action**
☐ **For your record**
☐ **For your command / approval**

Quantity	Description
1	Calibration Certificate of Sound Level Meter (PROJECT NO.: APJ18-181-CC001)

Remarks: Please stamp the duplicated copy with your company chop and return to us.

Acoustics and Air Testing Laboratory Co. Ltd.

ACOUSTICS AND AIR TESTING LABORATORY CO. LTD. (A+A) *L

Company Chop

Received By:

Company Chop

Received Date:

Room 422, Leader Industrial Center, 57-59 Au Pui Wan Street, Fo Tan, Shatin, N.T., Hong Kong
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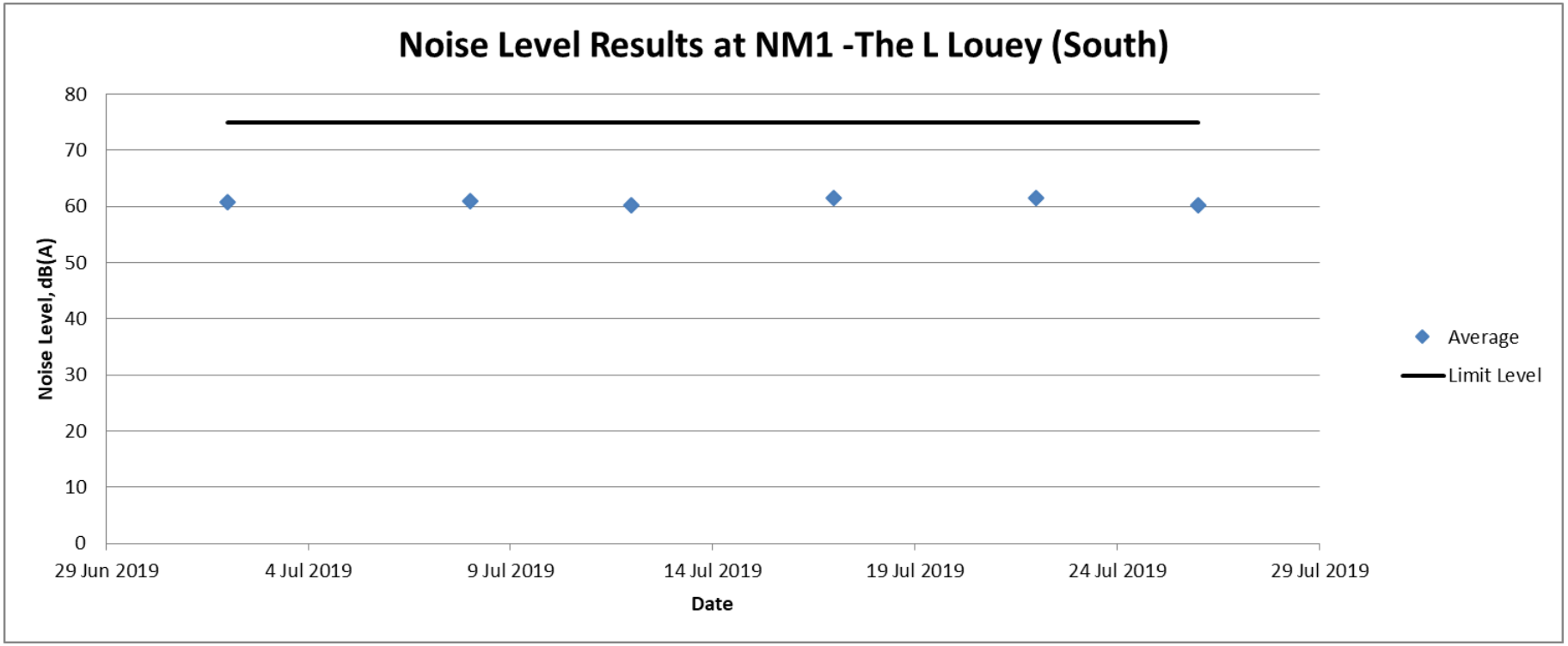
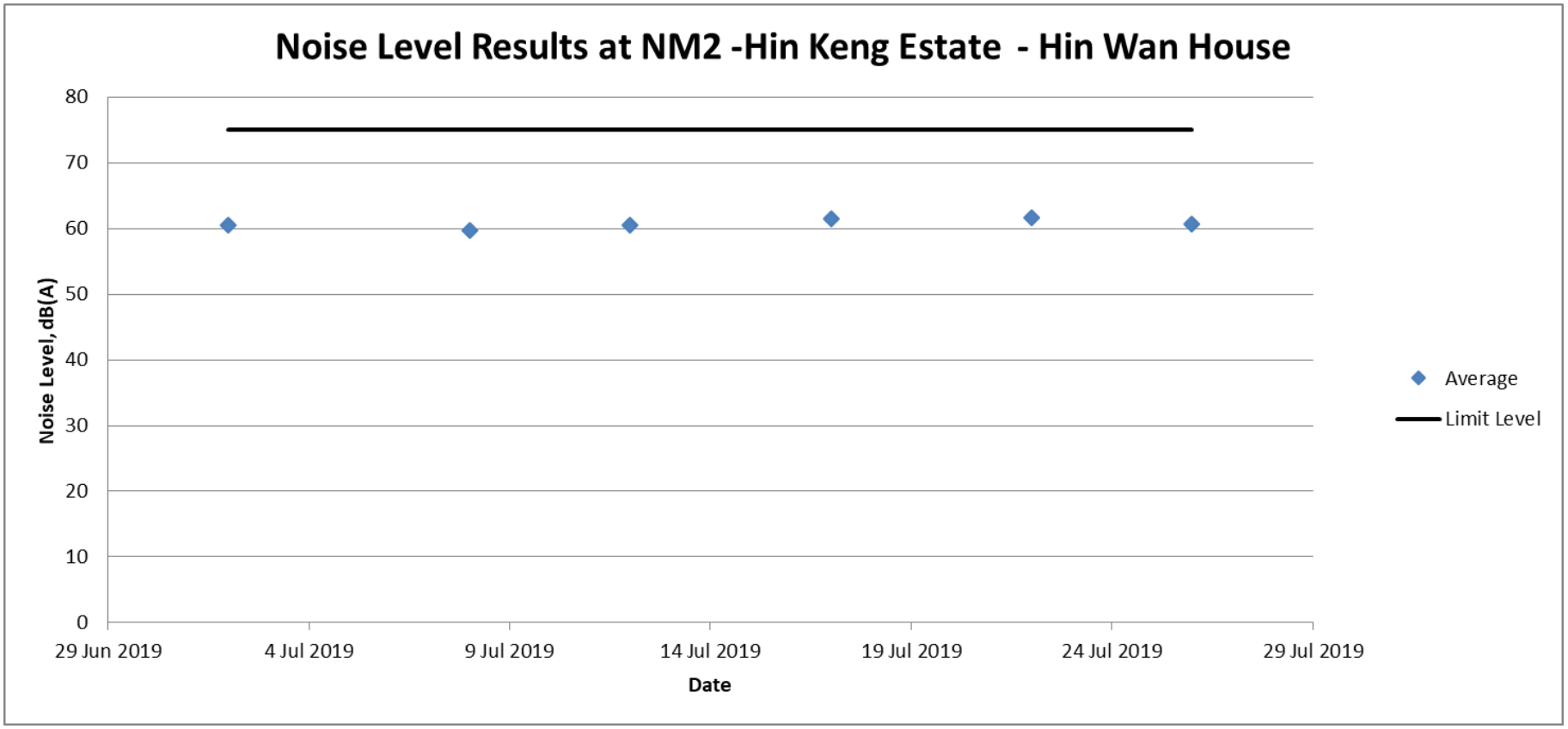
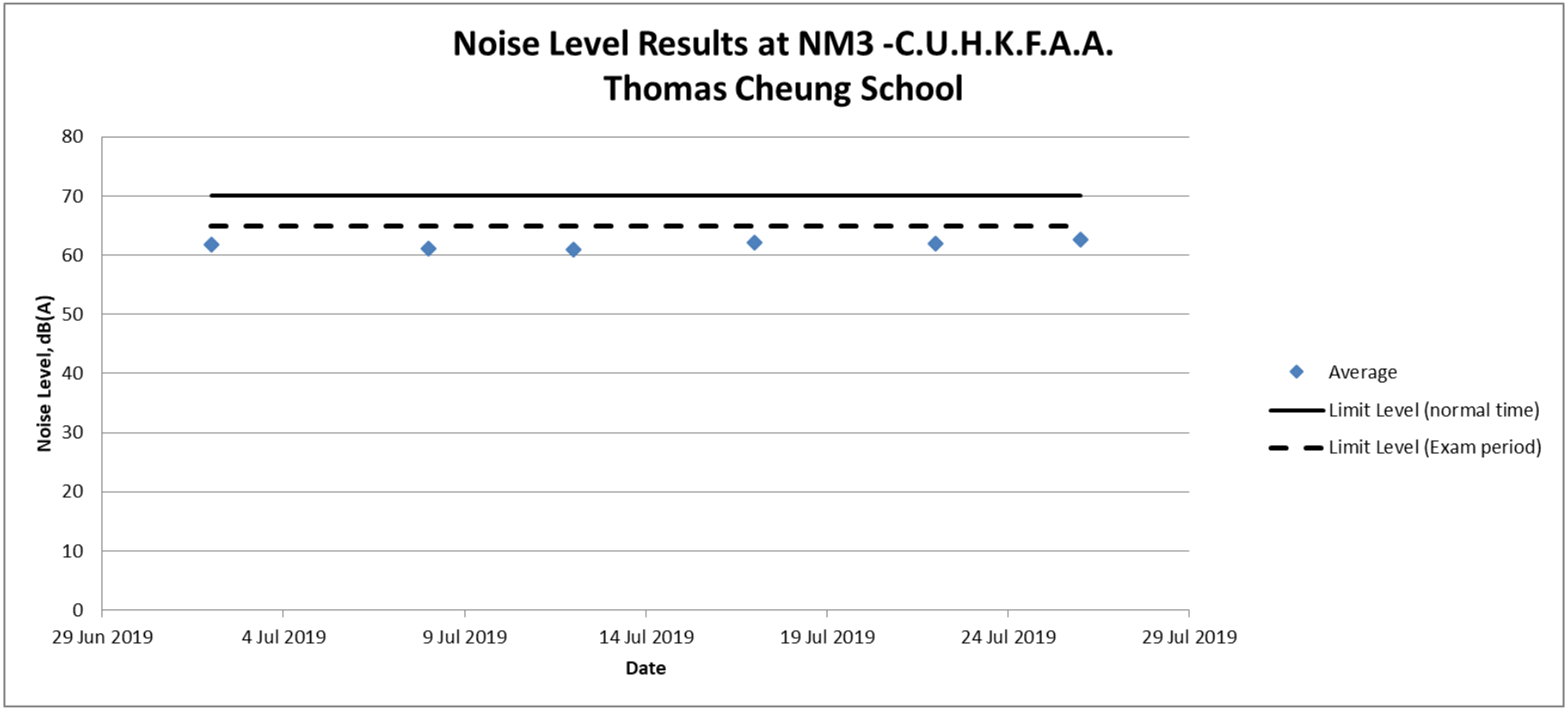
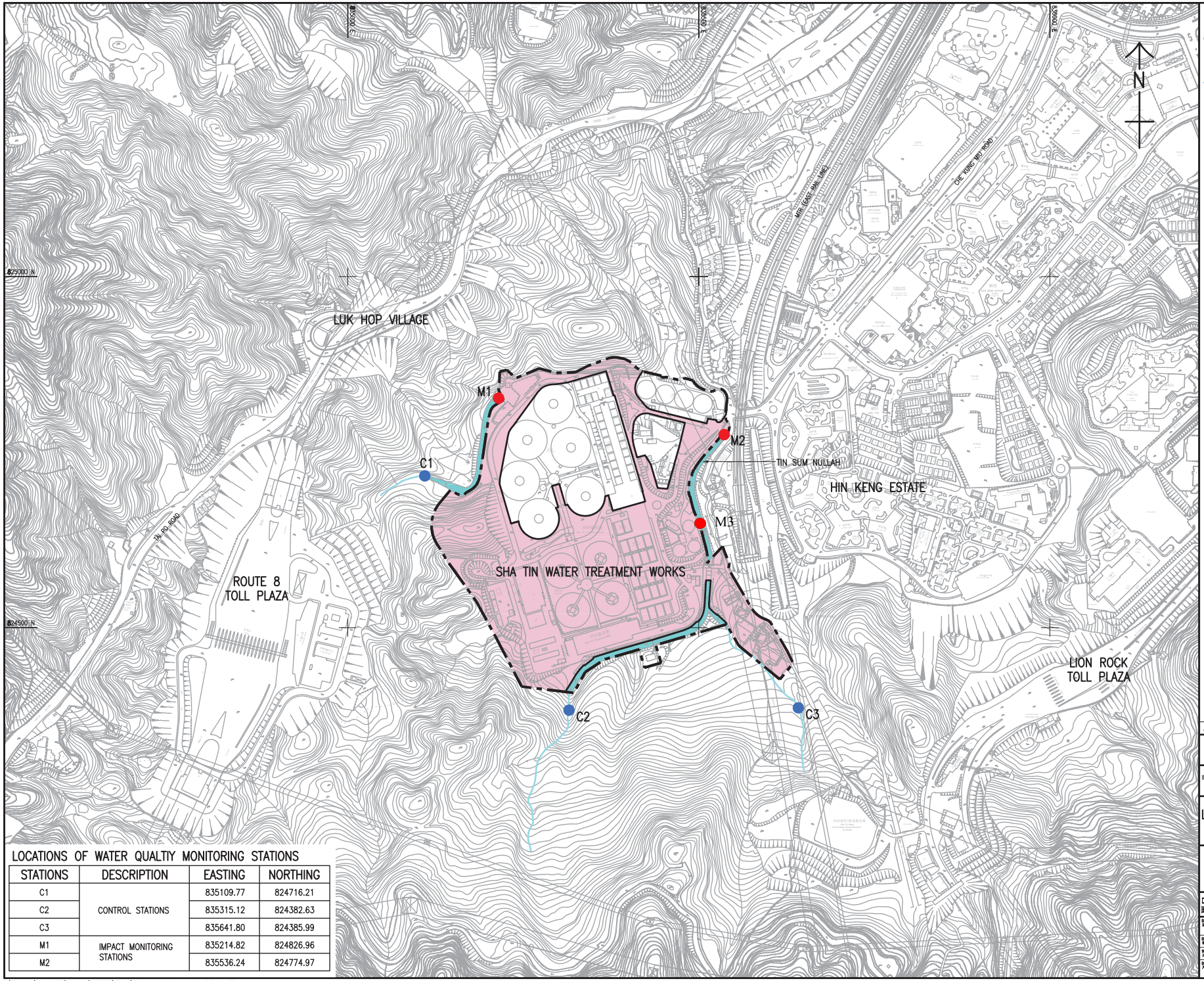
Appendix N
Impact Noise Monitoring Results and Graphical Presentation


Noise Level Results at NM1 -The L Louey (South)
Noise Level, dB(A)
80
70
60
50
40
30
20
10
0
29 Jun 2019
4 Jul 2019
9 Jul 2019
14 Jul 2019
19 Jul 2019
24 Jul 2019
29 Jul 2019
Date
Average
Limit Level


Noise Level Results at NM2 -Hin Keng Estate - Hin Wan House
Noise Level, dB(A)
80
70
60
50
40
30
20
10
0
29 Jun 2019
4 Jul 2019
9 Jul 2019
14 Jul 2019
19 Jul 2019
24 Jul 2019
29 Jul 2019
Date
Average
Limit Level


Noise Level Results at NM3 -C.U.H.K.F.A.A.
Thomas Cheung School
Noise Level, dB(A)
80
70
60
50
40
30
20
10
0
29 Jun 2019
4 Jul 2019
9 Jul 2019
14 Jul 2019
19 Jul 2019
24 Jul 2019
29 Jul 2019
Date
Average
Limit Level (normal time)
Limit Level (Exam period)

Appendix O
Location Plan of Water Quality Monitoring Station



LEGEND:

- SITE BOUNDARY OF SHATIN WATER TREATMENT WORKS
- WORKS AREA
- INLAND WATER COURSE
- IMPACT MONITORING STATION
- CONTROL STATION

LOCATIONS OF WATER QUALTIY MONITORING STATIONS

STATIONS	DESCRIPTION	EASTING	NORTHING
C1	CONTROL STATIONS	835109.77	824716.21
C2		835315.12	824382.63
C3		835641.80	824385.99
M1	IMPACT MONITORING STATIONS	835214.82	824826.96
M2		835536.24	824774.97

水務署
WATER SUPPLIES DEPARTMENT

AGREEMENT NO. CE 13/2009 (WS)
IN-SITU REPROVISIONING OF SHA TIN WATER TREATMENT WORKS-SOUTH WORKS
DESIGN AND CONSTRUCTION

LOCATIONS OF PROPOSED WATER QUALITY MONITORING STATIONS

AECOM

DRG.NO. 60162073/EM&A/FIG 5

DESIGNED BY: _
DRAWN BY: DXL
SCALE: A3 1 : 5000
DIMENSIONS ARE IN: METRES

P:\Projects\60162073\Drawing\REPORT\EM&A\801.dwg 2012-11-08 13:39 CAIZP

Appendix P
Calibration Certificate (Water Quality)

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre
1-3 Wing Yip Street, Kwai Chung
N.T., Hong Kong
T: +852 2610 1044 | F: +852 2610 2021

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR NELSON TSUI	WORK ORDER:	HK1917914
CLIENT:	ACUITY SUSTAINABILITY CONSULTING LIMITED		
ADDRESS:	1908, iPLACE, NOS. 301-305 CASTLE PEAK ROAD, KWAI CHUNG, NEW TERRITORIES, HONG KONG	SUB-BATCH: LABORATORY: DATE RECEIVED: DATE OF ISSUE:	0 HONG KONG 30-Apr-2019 09-May-2019

COMMENTS

The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.

The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.

The "Next Calibration Date" is recommended according to best practice principle as practised by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test:	Dissolved Oxygen, pH Value, Turbidity, Salinity, Redox Potential and Temperature
Equipment Type:	Multifunctional Meter
Brand Name:	HORIBA
Model No.:	U-5000 Multiparameter Water Quality Meter
Serial No.:	--
Equipment No.:	BGYP9CKD
Date of Calibration:	09-May-2019

NOTES

This is the Final Report and supersedes any preliminary report with this batch number.

Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

Mr Chan Siu Ming, Vico
Manager - Inorganic

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

WORK ORDER: HK1917914

SUB-BATCH: 0
DATE OF ISSUE: 09-May-2019
CLIENT: ACUITY SUSTAINABILITY CONSULTING LIMITED

Equipment Type: Multifunctional Meter
Brand Name: HORIBA
Model No.: U-5000 Multiparameter Water Quality Meter
Serial No.: --
Equipment No.: BGYP9CKD
Date of Calibration: 09-May-2019 Date of Next Calibration: 09-Aug-2019

PARAMETERS:

Dissolved Oxygen Method Ref: APHA (21st edition), 4500-O: G

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
8.10	8.11	+0.01
5.57	5.42	-0.15
3.15	3.06	-0.09
	Tolerance Limit (mg/L)	±0.20

pH Value Method Ref: APHA (21st edition), 4500H:B

Expected Reading (pH unit)	Displayed Reading (pH unit)	Tolerance (pH unit)
4.0	3.94	-0.06
7.0	7.06	+0.06
10.0	9.87	-0.13
	Tolerance Limit (pH unit)	±0.20

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr Chan Siu Ming, Vico
Manager - Inorganic

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

WORK ORDER: HK1917914

SUB-BATCH: 0
DATE OF ISSUE: 09-May-2019
CLIENT: ACUITY SUSTAINABILITY CONSULTING LIMITED

Equipment Type: Multifunctional Meter
Brand Name: HORIBA
Model No.: U-5000 Multiparameter Water Quality Meter
Serial No.: --
Equipment No.: BGYP9CKD
Date of Calibration: 09-May-2019 Date of Next Calibration: 09-Aug-2019

PARAMETERS:

Turbidity

Method Ref: APHA (21st edition), 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.33	--
4	4.21	+5.3
40	42.3	+5.7
80	81.3	+1.6
400	402	+0.5
800	845	+5.6
	Tolerance Limit (%)	±10.0

Salinity

Method Ref: APHA (21st edition), 2520B

Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)
0	0.0	--
10	9.8	-2.0
20	19.7	-1.5
30	29.9	-0.3
	Tolerance Limit (%)	±10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr Chan Siu Ming, Vico
Manager - Inorganic

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

WORK ORDER: HK1917914

SUB-BATCH: 0
DATE OF ISSUE: 09-May-2019
CLIENT: ACUITY SUSTAINABILITY CONSULTING LIMITED

Equipment Type: Multifunctional Meter
Brand Name: HORIBA
Model No.: U-5000 Multiparameter Water Quality Meter
Serial No.: --
Equipment No.: BGYP9CKD
Date of Calibration: 09-May-2019 Date of Next Calibration: 09-Aug-2019

PARAMETERS:

Temperature Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

Expected Reading (^{o}C)	Displayed Reading (^{o}C)	Tolerance (^{o}C)
9.5	10.11	+0.6
19.0	19.45	+0.4
38.5	39.05	+0.5
	Tolerance Limit (^{o}C)	±2.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr Chan Siu Ming, Vico
Manager - Inorganic

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

WORK ORDER: HK1917914

SUB-BATCH: 0
DATE OF ISSUE: 09-May-2019
CLIENT: ACUITY SUSTAINABILITY CONSULTING LIMITED

Equipment Type: Multifunctional Meter
Brand Name: HORIBA
Model No.: U-5000 Multiparameter Water Quality Meter
Serial No.: --
Equipment No.: BGYP9CKD
Date of Calibration: 09-May-2019 Date of Next Calibration: 09-Aug-2019

PARAMETERS:

Redox Potential

Method Ref: APHA (21st edition), 2580B
Method Ref: Orion Research Instruction Manual and the Laboratory Manual the Environmental of Water, Wastewater and Soil (2nd edition), Rump & Krist (1992)

Expected Reading (mV)	Displayed Reading (mV)	Difference of A and B (mV)
Solution A (~234mV)	68	
Solution B (~300mV)	115	+47.0
	Tolerance Limit (mV)	>66

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr Chan Siu Ming, Vico
Manager - Inorganic

Appendix Q
The Certification of Laboratory with HOKLAS accredited Analytical Tests

Hong Kong Accreditation Service
香港認可處

Certificate of Accreditation
認可證書

This is to certify that
特此證明

ACUMEN LABORATORY AND TESTING LIMITED
浩科檢測中心有限公司

Lot 12, Tam Kon Shan Road, North Tsing Yi, New Territories, Hong Kong
香港新界青衣北担杆山路12路段

has been accepted by the HKAS Executive, on the recommendation of the Accreditation Advisory Board, as a
在認可諮詢委員會的建議下獲香港認可處執行機關接受為

HOKLAS Accredited Laboratory
「香港實驗所認可計劃」認可實驗所

This laboratory meets the requirements of ISO/IEC 17025:2005 and it has been accredited for performing specific tests or calibrations as listed in the scope of accreditation within the test category of

Environmental Testing

此實驗所符合ISO/IEC 17025:2005所訂的要求
並獲認可進行載於認可範圍內下述測試類別中的指定測試或校正工作

環境測試

This accreditation to ISO/IEC 17025:2005 demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (see joint IAF-ILAC-ISO Communiqué).
此項 ISO/IEC 17025:2005 的認可資格證明此實驗所具備指定範疇內所須的技術能力並實施一套實驗所質量管理體系(見國際認可論壇、國際實驗所認可合作組織及國際標準化組織的聯合公報)。

The common seal of the Hong Kong Accreditation Service is affixed hereto by the authority of the HKAS Executive
現經香港認可處執行機關授權在此蓋上香港認可處的印章

WONG Wang-wah, Executive Administrator
執行幹事 黃宏華
Issue Date : 16 July 2014
簽發日期：二零一四年七月十六日

Registration Number : HOKLAS 241
註冊號碼：

Date of First Registration : 16 July 2014
首次註冊日期：二零一四年七月十六日

This certificate is issued subject to the terms and conditions laid down by HKAS
本證書按照香港認可處訂立的條款及條件發出

L 001195

Appendix R
Impact Water Quality Monitoring Results

Acumen Laboratory and Testing Limited

Lot 12, Tam Kon Shan Road, Tsing Yi (N), Hong Kong
Tel: (852) 2333 6823 Fax: (852) 2333 1316

Test Report

Report Number	: Q190003aR190701
Job Number	: R190701
Issue Date	: 08/08/2019
Name of Applicant	: Acumen Environmental Engineering and Technologies Co., Ltd.
Address of Applicant	: No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.
Project Name	: CJO-3113-549
Sample Description	: pH Value, TSS and COD tests
Laboratory ID	: R190701/1
Date of Sampling	: 18/07/2019
Date Received	: 18/07/2019
Test Period	: 18/07/2019 –19/07/2019
Test Required	: 1. pH Value; 2. Total Suspended Solids (TSS); 3. Chemical Oxygen Demand (COD)
Method Used	: 1. QPL-15d, APHA 22ed 4500-H^+ B 2. QPL-15e, APHA 22ed 2540 D 3. QPL-15f, APHA 22ed 5220 B
Test Result	: Refer to the results on page 2.

For and on behalf of

Acumen Laboratory and Testing Limited

Authorized Signature: _____

Hui Wai Fung, Huntington

Laboratory Manager

Chemical Division

Acumen Laboratory and Testing Limited

Lot 12, Tam Kon Shan Road, Tsing Yi (N), Hong Kong
Tel: (852) 2333 6823 Fax: (852) 2333 1316

Test Report

Report Number : Q190003aR190701

Job Number : R190701

Issue Date : 08/08/2019

Test Result:

Lab ID	Date of Sampling	Client Sample ID	pH Value at (measured temperature °C)	Total Suspended Solids (TSS), mg/L	Chemical Oxygen Demand (COD), mg O_2/L
R190701/1	18/07/2019	Hing Keng, Wall C	7.5 (23)	<2.5	<50

Note:
1. mg/L indicates milligram per liter
2. mg O_2/ L indicates milligram oxygen per liter
3. < indicates less than.
4. > indicates more than.
5. NA indicates Not Applicable.

End of Report

Date	Time	Weather	Location	Co-ordinates		Water Depth	Sample Depth	Temp.		DO con.		DO Saturation		Turbidity		pH		SS
				East	North	m	m	°C		mg/L		%		NTU		unit		mg/L
2 Jul 2019	9:10	Cloudy	C1	835110	824716	0.04	0.02	29.2	29.2	8.35	8.34	88.4	88.4	2.4	2.4	7.63	7.64	4.7
	9:19	Cloudy	C2	835403	824470	0.02	0.01	29.3	29.3	8.33	8.33	87.3	87.3	2.6	2.6	7.77	7.76	6.2
	N/A	N/A	C3	835642	824386	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9:29	Cloudy	M1	835215	824827	0.8	0.4	29.6	29.6	9.01	9.02	96.2	96.3	2.2	2.2	7.6	7.61	3.0
	9:47	Cloudy	M2	835536	824775	0.05	0.025	29.4	29.5	9.21	9.24	98.1	98.1	1.7	1.8	7.73	7.73	5.3
	9:58	Cloudy	M3	835501	824648	0.02	0.01	29.4	29.4	9.26	9.25	97.2	97.3	0.6	0.6	7.65	7.65	<1
4 Jul 2019	9:10	Cloudy	C1	835110	824716	0.04	0.02	28.1	28.1	8.41	8.42	91.5	91.6	2.5	2.6	7.84	7.84	4.9
	9:18	Cloudy	C2	835403	824470	0.02	0.01	28	28	8.45	8.46	92	91.8	2.5	2.6	7.75	7.77	5.7
	N/A	N/A	C3	835642	824386	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9:31	Cloudy	M1	835215	824827	0.8	0.4	27.6	27.5	9.21	9.23	96	96.1	2	2.1	7.63	7.62	2.9
	9:48	Cloudy	M2	835536	824775	0.05	0.025	27.4	27.6	9.2	9.23	97.2	97.5	1.8	1.9	7.72	7.72	6.2
	9:55	Cloudy	M3	835501	824648	0.02	0.01	27.4	27.4	9.31	9.3	97.3	97.3	0.9	0.9	7.66	7.66	<1
6 Jul 2019	10:25	Cloudy	C1	835110	824716	0.04	0.02	27.1	27.1	8.41	8.42	89.3	89.2	2.4	2.3	7.81	7.82	4.4
	10:33	Cloudy	C2	835403	824470	0.02	0.01	26.9	26.9	8.7	8.72	91.9	91.7	2.4	2.5	7.71	7.7	5.1
	N/A	N/A	C3	835642	824386	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10:40	Cloudy	M1	835215	824827	0.8	0.4	26.4	26.4	9.1	9.13	96.2	96.4	1.9	1.8	7.65	7.66	3.0
	10:51	Cloudy	M2	835536	824775	0.05	0.025	26.5	26.5	9.21	9.26	96	95.8	1.7	1.8	7.7	7.71	4.8
	10:59	Cloudy	M3	835501	824648	0.02	0.01	26.6	26.6	9.4	9.41	97.5	97.2	0.6	0.5	7.66	7.65	<1
8 Jul 2019	11:30	Fine	C1	835110	824716	0.04	0.02	30	30	8.35	8.36	88.4	88.4	2.5	2.5	7.85	7.84	5.3
	11:52	Fine	C2	835403	824470	0.02	0.01	30.1	30	8.72	8.72	92	92	2.4	2.4	7.76	7.77	5.7
	N/A	N/A	C3	835642	824386	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12:23	Fine	M1	835215	824827	0.8	0.4	29.5	29.4	9.19	9.19	96.9	96.9	2.2	2.1	7.66	7.67	3.2
	12:40	Fine	M2	835536	824775	0.05	0.025	29.7	29.8	9.21	9.2	96	96	1.8	1.8	7.73	7.73	5.9
	13:00	Fine	M3	835501	824648	0.02	0.01	29.7	29.9	9.26	9.26	97.4	97.5	0.5	0.5	7.67	7.66	<1
10 Jul 2019	11:35	Cloudy	C1	835110	824716	0.04	0.02	29.5	29.4	8.52	8.52	89.9	89.9	2.5	2.5	7.61	7.61	4.7
	11:55	Cloudy	C2	835403	824470	0.02	0.01	29.2	29.3	8.35	8.35	88.3	88.2	2.6	2.5	7.45	7.47	4.9
	N/A	N/A	C3	835642	824386	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12:22	Cloudy	M1	835215	824827	0.8	0.4	30.1	30.1	8.97	8.97	94.5	94.5	2.3	2.3	7.8	7.81	3.1
	12:37	Cloudy	M2	835536	824775	0.05	0.025	30.5	30.5	9.15	9.15	96.3	96.3	1.7	1.6	7.78	7.77	5.4
	12:57	Cloudy	M3	835501	824648	0.02	0.01	30.5	30.5	9.55	9.55	100.4	100.5	0.7	0.7	7.7	7.69	<1
12 Jul 2019	11:27	Sunny	C1	835110	824716	0.04	0.02	29.2	29.2	8.73	8.74	92.2	92.3	2.5	2.5	7.57	7.56	4.8
	11:43	Sunny	C2	835403	824470	0.02	0.01	29.7	29.8	8.6	8.61	90.8	90.8	2.7	2.8	7.41	7.4	5.6
	N/A	N/A	C3	835642	824386	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12:16	Sunny	M1	835215	824827	0.8	0.4	29.8	29.8	9.14	9.14	96.3	96.3	2	1.9	7.6	7.61	3.0
	12:37	Sunny	M2	835536	824775	0.05	0.025	29.6	29.5	9.31	9.31	98.1	98.2	2	1.9	7.71	7.71	6.1
	12:59	Sunny	M3	835501	824648	0.02	0.01	29.4	29.4	9.51	9.52	100.2	100.3	0.5	0.4	7.54	7.52	<1

15 Jul 2019	11:35	Cloudy	C1	835110	824716	0.04	0.02	27	27.1	8.79	8.79	93.1	93.2	2.6	2.5	7.6	7.61	5.0
	11:57	Cloudy	C2	835403	824470	0.02	0.01	27.7	27.7	8.56	8.55	90.6	90.6	2.7	2.6	7.86	7.86	6.4
	N/A	N/A	C3	835642	824386	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12:19	Cloudy	M1	835215	824827	0.8	0.4	27.3	27.2	9.31	9.31	98.5	98.4	2.1	2.2	7.76	7.78	2.8
	12:33	Cloudy	M2	835536	824775	0.05	0.025	27.4	27.4	9.16	9.17	96.9	97	1.9	1.8	7.68	7.67	5.3
	12:53	Cloudy	M3	835501	824648	0.02	0.01	27.2	27.3	9.25	9.26	97.9	97.9	0.4	0.5	7.61	7.59	<1
17 Jul 2019	11:35	Cloudy	C1	835110	824716	0.04	0.02	29.5	29.4	8.52	8.52	89.9	89.9	2.5	2.5	7.61	7.61	4.5
	11:55	Cloudy	C2	835403	824470	0.02	0.01	29.2	29.3	8.35	8.35	88.3	88.2	2.6	2.5	7.45	7.47	4.8
	N/A	N/A	C3	835642	824386	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12:12	Cloudy	M1	835215	824827	0.8	0.4	29.6	29.6	9.04	9.05	95.3	95.4	2	2	7.66	7.67	3.0
	15:15	Cloudy	M2	835536	824775	0.05	0.025	29.3	29.3	8.95	8.95	94.6	94.6	1.8	1.9	7.73	7.73	5.8
	15:43	Cloudy	M3	835501	824648	0.02	0.01	29.9	30	9.36	9.37	98.7	98.7	0.4	0.5	7.67	7.66	<1
19 Jul 2019	10:39	Fine	C1	835110	824716	0.04	0.02	29.1	29.1	8.76	8.77	91.2	91.2	2.4	2.5	7.79	7.8	5.6
	10:28	Fine	C2	835403	824470	0.02	0.01	29.5	29.6	8.63	8.61	91.1	91.1	2.8	2.8	7.5	7.51	4.5
	N/A	N/A	C3	835642	824386	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	10:18	Fine	M1	835215	824827	0.8	0.4	29.2	29.2	9.3	9.31	96.3	96.3	2.1	2	7.75	7.75	3.3
	10:00	Fine	M2	835536	824775	0.05	0.025	29.4	29.5	8.91	8.91	97.2	97.1	1.8	1.8	7.62	7.61	4.5
	9:49	Fine	M3	835501	824648	0.02	0.01	29.4	29.5	9.34	9.34	98.1	98.1	0.4	0.4	7.71	7.71	<1
22 Jul 2019	10:38	Cloudy	C1	835110	824716	0.04	0.02	26.2	26.3	8.57	8.57	91	91	2.3	2.3	7.72	7.71	4.1
	10:28	Cloudy	C2	835403	824470	0.02	0.01	26.5	26.4	8.41	8.41	90.5	90.4	2.7	2.6	7.31	7.3	5.3
	N/A	N/A	C3	835642	824386	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	9:55	Cloudy	M1	835215	824827	0.8	0.4	26.7	26.6	8.98	8.98	97.1	97.2	2.1	1.8	7.72	7.72	2.8
	9:40	Cloudy	M2	835536	824775	0.05	0.025	26.9	26.9	9.31	9.3	98.7	98.7	1.9	1.8	7.78	7.77	4.9
	10:18	Cloudy	M3	835501	824648	0.02	0.01	26.5	26.5	9.5	9.52	99.1	99.1	0.4	0.4	7.62	7.63	<1
24 Jul 2019	11:16	Fine	C1	835110	824716	0.04	0.02	26.1	26	8.73	8.72	92.7	92.7	2.3	2.3	7.31	7.31	5.8
	11:40	Fine	C2	835403	824470	0.02	0.01	26.4	26.3	8.57	8.57	91	91.1	2.8	2.8	7.24	7.24	6.6
	N/A	N/A	C3	835642	824386	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	12:03	Fine	M1	835215	824827	0.8	0.4	25.9	26	9.06	9.06	96.2	96.2	2.1	2	7.76	7.78	2.9
	12:26	Fine	M2	835536	824775	0.05	0.025	26	25.9	9.32	9.31	98.8	98.8	1.8	1.9	7.68	7.67	6.4
	12:47	Fine	M3	835501	824648	0.02	0.01	25.9	25.9	9.59	9.59	101.6	101.6	0.5	0.5	7.61	7.59	<1
26 Jul 2019	11:29	Cloudy	C1	835110	824716	0.04	0.02	29.4	29.3	8.2	8.23	86.7	86.7	2.6	2.6	7.51	7.52	6.2
	12:18	Cloudy	C2	835403	824470	0.02	0.01	29.3	29.3	8.77	8.76	91.1	91.1	2.5	2.4	7.41	7.42	6.3
	N/A	N/A	C3	835642	824386	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	11:41	Cloudy	M1	835215	824827	0.8	0.4	29.2	29.2	9.21	9.22	97.1	97	1.9	1.9	7.31	7.32	3.2
	11:50	Cloudy	M2	835536	824775	0.05	0.025	29.3	29.2	9.22	9.2	95.6	95.4	2.1	2.1	7.52	7.51	6.0
	11:59	Cloudy	M3	835501	824648	0.02	0.01	29.4	29.4	9.51	9.52	99.5	99.4	0.9	0.9	7.11	7.13	<1
29 Jul 2019	15:05	Cloudy	C1	835110	824716	0.04	0.02	28.70	28.70	8.77	8.77	93.1	93	2.7	2.7	7.54	7.54	4.6
	15:18	Cloudy	C2	835403	824470	0.02	0.01	29.80	29.80	8.79	8.79	93.3	93.3	2.4	2.4	7.39	7.4	5.7
	N/A	N/A	C3	835642	824386	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	15:35	Cloudy	M1	835215	824827	0.8	0.4	28.60	28.60	9.07	9.07	98.7	98.6	2.1	2	7.3	7.3	2.9
	15:57	Cloudy	M2	835536	824775	0.05	0.025	28.50	28.50	9.23	9.23	95.7	95.7	1.5	1.6	7.5	7.5	5.8
	16:19	Cloudy	M3	835501	824648	0.02	0.01	29.30	29.30	9.51	9.51	101	101	0.7	0.6	7.15	7.14	<1

Acumen Laboratory and Testing Limited

Lot 12, Tam Kon Shan Road, Tsing Yi (N), Hong Kong
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Test Report

Report Number	: Q190003aR190693
Job Number	: R190693
Issue Date	: 08/08/2019
Name of Applicant	: Acumen Environmental Engineering and Technologies Co., Ltd.
Address of Applicant	: No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.
Project Name	: CJO-3113-541
Sample Description	: SS test
Laboratory ID	: R190693/1-5
Date of Sampling	: 02/07/2019
Date Received	: 02/07/2019
Test Period	: 02/07/2019 – 03/07/2019
Test Required	: 1. Suspended Solids (SS)
Method Used	: 1. QPL-15e, APHA 22ed 2540 D
Test Result	: Refer to the results on page 2.

For and on behalf of
Acumen Laboratory and Testing Limited

Authorized Signature: _____

Hui Wai Fung, Huntington
Laboratory Manager
Chemical Division

Acumen Laboratory and Testing Limited

Lot 12, Tam Kon Shan Road, Tsing Yi (N), Hong Kong
Tel: (852) 2333 6823 Fax: (852) 2333 1316

Test Report

Report Number : Q190003aR190693

Job Number : R190693

Issue Date : 08/08/2019

Test Result:

Lab ID	Date of Sampling	Client Sample ID	Suspended Solids (SS), mg/L
R190693/1	02/07/2019	C1	4.7
R190693/2	02/07/2019	C2	6.2
R190693/3	02/07/2019	M1	3.0
R190693/4	02/07/2019	M2	5.3
R190693/5	02/07/2019	M3	<1

Note:
1. mg/L indicates milligram per liter
2. mg O_2/ L indicates milligram oxygen per liter
3. < indicates less than.
4. > indicates more than.
5. NA indicates Not Applicable.

End of Report

Acumen Laboratory and Testing Limited

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Test Report

Report Number	: Q190003aR190694
Job Number	: R190694
Issue Date	: 08/08/2019
Name of Applicant	: Acumen Environmental Engineering and Technologies Co., Ltd.
Address of Applicant	: No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.
Project Name	: CJO-3113-542
Sample Description	: SS test
Laboratory ID	: R190694/1-5
Date of Sampling	: 04/07/2019
Date Received	: 04/07/2019
Test Period	: 04/07/2019– 05/07/2019
Test Required	: 1. Suspended Solids (SS)
Method Used	: 1. QPL-15e, APHA 22ed 2540 D
Test Result	: Refer to the results on page 2.

For and on behalf of

Acumen Laboratory and Testing Limited

Authorized Signature: _____

Hui Wai Fung, Huntington
Laboratory Manager
Chemical Division

Acumen Laboratory and Testing Limited

Lot 12, Tam Kon Shan Road, Tsing Yi (N), Hong Kong
Tel: (852) 2333 6823 Fax: (852) 2333 1316

Test Report

Report Number : Q190003aR190694

Job Number : R190694

Issue Date : 08/08/2019

Test Result:

Lab ID	Date of Sampling	Client Sample ID	Suspended Solids (SS), mg/L
R190694/1	04/07/2019	C1	4.9
R190694/2	04/07/2019	C2	5.7
R190694/3	04/07/2019	M1	2.9
R190694/4	04/07/2019	M2	6.2
R190694/5	04/07/2019	M3	<1

Note:
1. mg/L indicates milligram per liter
2. mg O_2/ L indicates milligram oxygen per liter
3. < indicates less than.
4. > indicates more than.
5. NA indicates Not Applicable.

End of Report

Acumen Laboratory and Testing Limited

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Test Report

Report Number	: Q190003aR190695
Job Number	: R190695
Issue Date	: 08/08/2019
Name of Applicant	: Acumen Environmental Engineering and Technologies Co., Ltd.
Address of Applicant	: No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.
Project Name	: CJO-3113-543
Sample Description	: SS test
Laboratory ID	: R190695/1-5
Date of Sampling	: 06/07/2019
Date Received	: 06/07/2019
Test Period	: 06/07/2019– 07/07/2019
Test Required	: 1. Suspended Solids (SS)
Method Used	: 1. QPL-15e, APHA 22ed 2540 D
Test Result	: Refer to the results on page 2.

For and on behalf of

Acumen Laboratory and Testing Limited

Authorized Signature: _____

Hui Wai Fung, Huntington
Laboratory Manager
Chemical Division

Acumen Laboratory and Testing Limited

Lot 12, Tam Kon Shan Road, Tsing Yi (N), Hong Kong
Tel: (852) 2333 6823 Fax: (852) 2333 1316

Test Report

Report Number : Q190003aR190695

Job Number : R190695

Issue Date : 08/08/2019

Test Result:

Lab ID	Date of Sampling	Client Sample ID	Suspended Solids (SS), mg/L
R190695/1	06/07/2019	C1	4.4
R190695/2	06/07/2019	C2	5.1
R190695/3	06/07/2019	M1	3.0
R190695/4	06/07/2019	M2	4.8
R190695/5	06/07/2019	M3	<1

Note:
1. mg/L indicates milligram per liter
2. mg O_2/ L indicates milligram oxygen per liter
3. < indicates less than.
4. > indicates more than.
5. NA indicates Not Applicable.

End of Report

Acumen Laboratory and Testing Limited

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Test Report

Report Number	: Q190003aR190696
Job Number	: R190696
Issue Date	: 08/08/2019
Name of Applicant	: Acumen Environmental Engineering and Technologies Co., Ltd.
Address of Applicant	: No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.
Project Name	: CJO-3113-544
Sample Description	: SS test
Laboratory ID	: R190696/1-5
Date of Sampling	: 08/07/2019
Date Received	: 08/07/2019
Test Period	: 08/07/2019– 09/07/2019
Test Required	: 1. Suspended Solids (SS)
Method Used	: 1. QPL-15e, APHA 22ed 2540 D
Test Result	: Refer to the results on page 2.

For and on behalf of

Acumen Laboratory and Testing Limited

Authorized Signature: _____

Hui Wai Fung, Huntington
Laboratory Manager
Chemical Division

Acumen Laboratory and Testing Limited

Lot 12, Tam Kon Shan Road, Tsing Yi (N), Hong Kong
Tel: (852) 2333 6823 Fax: (852) 2333 1316

Test Report

Report Number : Q190003aR190696

Job Number : R190696

Issue Date : 08/08/2019

Test Result:

Lab ID	Date of Sampling	Client Sample ID	Suspended Solids (SS), mg/L
R190696/1	08/07/2019	C1	5.3
R190696/2	08/07/2019	C2	5.7
R190696/3	08/07/2019	M1	3.2
R190696/4	08/07/2019	M2	5.9
R190696/5	08/07/2019	M3	<1

Note:
1. mg/L indicates milligram per liter
2. mg O_2/ L indicates milligram oxygen per liter
3. < indicates less than.
4. > indicates more than.
5. NA indicates Not Applicable.

End of Report

Acumen Laboratory and Testing Limited

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Test Report

Report Number	: Q190003aR190697
Job Number	: R190697
Issue Date	: 08/08/2019
Name of Applicant	: Acumen Environmental Engineering and Technologies Co., Ltd.
Address of Applicant	: No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.
Project Name	: CJO-3113-545
Sample Description	: SS test
Laboratory ID	: R190697/1-5
Date of Sampling	: 10/07/2019
Date Received	: 10/07/2019
Test Period	: 10/07/2019– 11/07/2019
Test Required	: 1. Suspended Solids (SS)
Method Used	: 1. QPL-15e, APHA 22ed 2540 D
Test Result	: Refer to the results on page 2.

For and on behalf of

Acumen Laboratory and Testing Limited

Authorized Signature: _____

Hui Wai Fung, Huntington
Laboratory Manager
Chemical Division

Acumen Laboratory and Testing Limited

Lot 12, Tam Kon Shan Road, Tsing Yi (N), Hong Kong
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Test Report

Report Number : Q190003aR190697

Job Number : R190697

Issue Date : 08/08/2019

Test Result:

Lab ID	Date of Sampling	Client Sample ID	Suspended Solids (SS), mg/L
R190697/1	10/07/2019	C1	4.7
R190697/2	10/07/2019	C2	4.9
R190697/3	10/07/2019	M1	3.1
R190697/4	10/07/2019	M2	5.4
R190697/5	10/07/2019	M3	<1

Note:
1. mg/L indicates milligram per liter
2. mg O_2/ L indicates milligram oxygen per liter
3. < indicates less than.
4. > indicates more than.
5. NA indicates Not Applicable.

End of Report

Acumen Laboratory and Testing Limited

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Test Report

Report Number	: Q190003aR190698
Job Number	: R190698
Issue Date	: 08/08/2019
Name of Applicant	: Acumen Environmental Engineering and Technologies Co., Ltd.
Address of Applicant	: No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.
Project Name	: CJO-3113-546
Sample Description	: SS test
Laboratory ID	: R190698/1-5
Date of Sampling	: 12/07/2019
Date Received	: 12/07/2019
Test Period	: 12/07/2019 – 13/07/2019
Test Required	: 1. Suspended Solids (SS)
Method Used	: 1. QPL-15e, APHA 22ed 2540 D
Test Result	: Refer to the results on page 2.

For and on behalf of
Acumen Laboratory and Testing Limited

Authorized Signature: _____

Hui Wai Fung, Huntington
Laboratory Manager
Chemical Division

Acumen Laboratory and Testing Limited

Lot 12, Tam Kon Shan Road, Tsing Yi (N), Hong Kong
Tel: (852) 2333 6823 Fax: (852) 2333 1316

Test Report

Report Number : Q190003aR190698

Job Number : R190698

Issue Date : 08/08/2019

Test Result:

Lab ID	Date of Sampling	Client Sample ID	Suspended Solids (SS), mg/L
R190698/1	12/07/2019	C1	4.8
R190698/2	12/07/2019	C2	5.6
R190698/3	12/07/2019	M1	3.0
R190698/4	12/07/2019	M2	6.1
R190698/5	12/07/2019	M3	<1

Note:
1. mg/L indicates milligram per liter
2. mg O_2/ L indicates milligram oxygen per liter
3. < indicates less than.
4. > indicates more than.
5. NA indicates Not Applicable.

End of Report

Acumen Laboratory and Testing Limited

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Test Report

Report Number	: Q190003aR190699
Job Number	: R190699
Issue Date	: 08/08/2019
Name of Applicant	: Acumen Environmental Engineering and Technologies Co., Ltd.
Address of Applicant	: No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.
Project Name	: CJO-3113-547
Sample Description	: SS test
Laboratory ID	: R190699/1-5
Date of Sampling	: 15/07/2019
Date Received	: 15/07/2019
Test Period	: 15/07/2019– 16/07/2019
Test Required	: 1. Suspended Solids (SS)
Method Used	: 1. QPL-15e, APHA 22ed 2540 D
Test Result	: Refer to the results on page 2.

For and on behalf of

Acumen Laboratory and Testing Limited

Authorized Signature: _____

Hui Wai Fung, Huntington
Laboratory Manager
Chemical Division

Acumen Laboratory and Testing Limited

Lot 12, Tam Kon Shan Road, Tsing Yi (N), Hong Kong
Tel: (852) 2333 6823 Fax: (852) 2333 1316

Test Report

Report Number : Q190003aR190699

Job Number : R190699

Issue Date : 08/08/2019

Test Result:

Lab ID	Date of Sampling	Client Sample ID	Suspended Solids (SS), mg/L
R190699/1	15/07/2019	C1	5.0
R190699/2	15/07/2019	C2	6.4
R190699/3	15/07/2019	M1	2.8
R190699/4	15/07/2019	M2	5.3
R190699/5	15/07/2019	M3	<1

Note:
1. mg/L indicates milligram per liter
2. mg O_2/ L indicates milligram oxygen per liter
3. < indicates less than.
4. > indicates more than.
5. NA indicates Not Applicable.

End of Report

Acumen Laboratory and Testing Limited

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Test Report

Report Number	: Q190003aR190700
Job Number	: R190700
Issue Date	: 08/08/2019
Name of Applicant	: Acumen Environmental Engineering and Technologies Co., Ltd.
Address of Applicant	: No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.
Project Name	: CJO-3113-548
Sample Description	: SS test
Laboratory ID	: R190700/1-5
Date of Sampling	: 17/07/2019
Date Received	: 17/07/2019
Test Period	: 17/07/2019– 18/07/2019
Test Required	: 1. Suspended Solids (SS)
Method Used	: 1. QPL-15e, APHA 22ed 2540 D
Test Result	: Refer to the results on page 2.

For and on behalf of

Acumen Laboratory and Testing Limited

Authorized Signature: _____

Hui Wai Fung, Huntington
Laboratory Manager
Chemical Division

Acumen Laboratory and Testing Limited

Lot 12, Tam Kon Shan Road, Tsing Yi (N), Hong Kong
Tel: (852) 2333 6823 Fax: (852) 2333 1316

Test Report

Report Number : Q190003aR190700

Job Number : R190700

Issue Date : 08/08/2019

Test Result:

Lab ID	Date of Sampling	Client Sample ID	Suspended Solids (SS), mg/L
R190700/1	17/07/2019	C1	4.5
R190700/2	17/07/2019	C2	4.8
R190700/3	17/07/2019	M1	3.0
R190700/4	17/07/2019	M2	5.8
R190700/5	17/07/2019	M3	<1

Note:
1. mg/L indicates milligram per liter
2. mg O_2/ L indicates milligram oxygen per liter
3. < indicates less than.
4. > indicates more than.
5. NA indicates Not Applicable.

End of Report

Acumen Laboratory and Testing Limited

Lot 12, Tam Kon Shan Road, Tsing Yi (N), Hong Kong
Tel: (852) 2333 6823 Fax: (852) 2333 1316

Test Report

Report Number	: Q190003aR190702
Job Number	: R190702
Issue Date	: 08/08/2019
Name of Applicant	: Acumen Environmental Engineering and Technologies Co., Ltd.
Address of Applicant	: No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.
Project Name	: CJO-3113-550
Sample Description	: SS test
Laboratory ID	: R190702/1-5
Date of Sampling	: 19/07/2019
Date Received	: 19/07/2019
Test Period	: 19/07/2019– 20/07/2019
Test Required	: 1. Suspended Solids (SS)
Method Used	: 1. QPL-15e, APHA 22ed 2540 D
Test Result	: Refer to the results on page 2.

For and on behalf of
Acumen Laboratory and Testing Limited

Authorized Signature: _____

Hui Wai Fung, Huntington
Laboratory Manager
Chemical Division

Acumen Laboratory and Testing Limited

Lot 12, Tam Kon Shan Road, Tsing Yi (N), Hong Kong
Tel: (852) 2333 6823 Fax: (852) 2333 1316

Test Report

Report Number : Q190003aR190702

Job Number : R190702

Issue Date : 08/08/2019

Test Result:

Lab ID	Date of Sampling	Client Sample ID	Suspended Solids (SS), mg/L
R190702/1	19/07/2019	C1	5.6
R190702/2	19/07/2019	C2	4.5
R190702/3	19/07/2019	M1	3.3
R190702/4	19/07/2019	M2	4.5
R190702/5	19/07/2019	M3	<1

Note:
1. mg/L indicates milligram per liter
2. mg O_2/ L indicates milligram oxygen per liter
3. < indicates less than.
4. > indicates more than.
5. NA indicates Not Applicable.

End of Report

Acumen Laboratory and Testing Limited

Lot 12, Tam Kon Shan Road, Tsing Yi (N), Hong Kong
Tel: (852) 2333 6823 Fax: (852) 2333 1316

Test Report

Report Number	: Q190003aR190703
Job Number	: R190703
Issue Date	: 08/08/2019
Name of Applicant	: Acumen Environmental Engineering and Technologies Co., Ltd.
Address of Applicant	: No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.
Project Name	: CJO-3113-551
Sample Description	: SS test
Laboratory ID	: R190703/1-5
Date of Sampling	: 22/07/2019
Date Received	: 22/07/2019
Test Period	: 22/07/2019– 23/07/2019
Test Required	: 1. Suspended Solids (SS)
Method Used	: 1. QPL-15e, APHA 22ed 2540 D
Test Result	: Refer to the results on page 2.

For and on behalf of

Acumen Laboratory and Testing Limited

Authorized Signature: _____

Hui Wai Fung, Huntington
Laboratory Manager
Chemical Division

Acumen Laboratory and Testing Limited

Lot 12, Tam Kon Shan Road, Tsing Yi (N), Hong Kong
Tel: (852) 2333 6823 Fax: (852) 2333 1316

Test Report

Report Number : Q190003aR190703

Job Number : R190703

Issue Date : 08/08/2019

Test Result:

Lab ID	Date of Sampling	Client Sample ID	Suspended Solids (SS), mg/L
R190703/1	22/07/2019	C1	4.1
R190703/2	22/07/2019	C2	5.3
R190703/3	22/07/2019	M1	2.8
R190703/4	22/07/2019	M2	4.9
R190703/5	22/07/2019	M3	<1

Note:
1. mg/L indicates milligram per liter
2. mg O_2/ L indicates milligram oxygen per liter
3. < indicates less than.
4. > indicates more than.
5. NA indicates Not Applicable.

End of Report

Acumen Laboratory and Testing Limited

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Test Report

Report Number	: Q190003aR190704
Job Number	: R190704
Issue Date	: 08/08/2019
Name of Applicant	: Acumen Environmental Engineering and Technologies Co., Ltd.
Address of Applicant	: No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.
Project Name	: CJO-3113-552
Sample Description	: SS test
Laboratory ID	: R190704/1-5
Date of Sampling	: 24/07/2019
Date Received	: 24/07/2019
Test Period	: 24/07/2019 – 25/07/2019
Test Required	: 1. Suspended Solids (SS)
Method Used	: 1. QPL-15e, APHA 22ed 2540 D
Test Result	: Refer to the results on page 2.

For and on behalf of

Acumen Laboratory and Testing Limited

Authorized Signature: _____

Hui Wai Fung, Huntington
Laboratory Manager
Chemical Division

Acumen Laboratory and Testing Limited

Lot 12, Tam Kon Shan Road, Tsing Yi (N), Hong Kong
Tel: (852) 2333 6823 Fax: (852) 2333 1316

Test Report

Report Number : Q190003aR190704

Job Number : R190704

Issue Date : 08/08/2019

Test Result:

Lab ID	Date of Sampling	Client Sample ID	Suspended Solids (SS), mg/L
R190704/1	24/07/2019	C1	5.8
R190704/2	24/07/2019	C2	6.6
R190704/3	24/07/2019	M1	2.9
R190704/4	24/07/2019	M2	6.4
R190704/5	24/07/2019	M3	<1

Note:
1. mg/L indicates milligram per liter
2. mg O_2/ L indicates milligram oxygen per liter
3. < indicates less than.
4. > indicates more than.
5. NA indicates Not Applicable.

End of Report

Acumen Laboratory and Testing Limited

Lot 12, Tam Kon Shan Road, Tsing Yi (N), Hong Kong
Tel: (852) 2333 6823 Fax: (852) 2333 1316

Test Report

Report Number	: Q190003aR190705
Job Number	: R190705
Issue Date	: 08/08/2019
Name of Applicant	: Acumen Environmental Engineering and Technologies Co., Ltd.
Address of Applicant	: No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.
Project Name	: CJO-3113-553
Sample Description	: SS test
Laboratory ID	: R190705/1-5
Date of Sampling	: 26/07/2019
Date Received	: 26/07/2019
Test Period	: 26/07/2019 – 27/07/2019
Test Required	: 1. Suspended Solids (SS)
Method Used	: 1. QPL-15e, APHA 22ed 2540 D
Test Result	: Refer to the results on page 2.

For and on behalf of

Acumen Laboratory and Testing Limited

Authorized Signature: _____

Hui Wai Fung, Huntington
Laboratory Manager
Chemical Division

Acumen Laboratory and Testing Limited

Lot 12, Tam Kon Shan Road, Tsing Yi (N), Hong Kong
Tel: (852) 2333 6823 Fax: (852) 2333 1316

Test Report

Report Number : Q190003aR190705

Job Number : R190705

Issue Date : 08/08/2019

Test Result:

Lab ID	Date of Sampling	Client Sample ID	Suspended Solids (SS), mg/L
R190705/1	26/07/2019	C1	6.2
R190705/2	26/07/2019	C2	6.3
R190705/3	26/07/2019	M1	3.2
R190705/4	26/07/2019	M2	6.0
R190705/5	26/07/2019	M3	<1

Note:
1. mg/L indicates milligram per liter
2. mg O_2/ L indicates milligram oxygen per liter
3. < indicates less than.
4. > indicates more than.
5. NA indicates Not Applicable.

End of Report

Acumen Laboratory and Testing Limited

Lot 12, Tam Kon Shan Road, Tsing Yi (N), Hong Kong
Tel: (852) 2333 6823 Fax: (852) 2333 1316

Test Report

Report Number	: Q190003aR190706
Job Number	: R190706
Issue Date	: 08/08/2019
Name of Applicant	: Acumen Environmental Engineering and Technologies Co., Ltd.
Address of Applicant	: No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.
Project Name	: CJO-3113-554
Sample Description	: SS test
Laboratory ID	: R190706/1-5
Date of Sampling	: 29/07/2019
Date Received	: 29/07/2019
Test Period	: 29/07/2019 – 30/07/2019
Test Required	: 1. Suspended Solids (SS)
Method Used	: 1. QPL-15e, APHA 22ed 2540 D
Test Result	: Refer to the results on page 2.

For and on behalf of

Acumen Laboratory and Testing Limited

Authorized Signature: _____

Hui Wai Fung, Huntington
Laboratory Manager
Chemical Division

Acumen Laboratory and Testing Limited

Lot 12, Tam Kon Shan Road, Tsing Yi (N), Hong Kong
Tel: (852) 2333 6823 Fax: (852) 2333 1316

Test Report

Report Number : Q190003aR190706

Job Number : R190706

Issue Date : 08/08/2019

Test Result:

Lab ID	Date of Sampling	Client Sample ID	Suspended Solids (SS), mg/L
R190706/1	29/07/2019	C1	4.6
R190706/2	29/07/2019	C2	5.7
R190706/3	29/07/2019	M1	2.9
R190706/4	29/07/2019	M2	5.8
R190706/5	29/07/2019	M3	<1

Note:
1. mg/L indicates milligram per liter
2. mg O_2/ L indicates milligram oxygen per liter
3. < indicates less than.
4. > indicates more than.
5. NA indicates Not Applicable.

End of Report

Appendix S
Impact Monitoring report for Ecology

Post-Transplantation Monitoring Report

for Agreement No. CE 13/2009 (WS)

IN-SITU REPROVISIONING OF SHA TIN WATER TREATMENT WORKS – SOUTH WORKS

Report No.59

July 2019

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APPENDICES

1. INTRODUCTION

1.1 Pursuant to the Environmental Impact Assessment (EIA) Ordinance, the Director of Environmental Protection (DEP) granted the Environmental Permit (No. EP- 494/2015) to the Water Supplies Department (WSD) to construct and operate the designated project for "In-situ Reprovisioning of Sha Tin Water Treatment Works - South Works" ("The Project").

1.2 Upon the requirement of the Environmental Permit, a detailed vegetation report presenting the baseline vegetation condition for flora species with conservation interest, transplanting and monitoring programme for the Project has been prepared and approved by DEP in February 2016.

1.3 There were 4 flora species of conservation importance were recorded in the woodland habitat within project site including Ailanthus (*Ailanthus fordii*), Incense Tree (*Aquilaria sinensis*), Lamb of Tartary (*Cibotium barometz*) and Hong Kong Eagle's Claw (*Artabotrys hongkongensis*). In total, 2 nos. of Incense Tree (*Aquilaria sinensi*s), 1 no. of Ailanthus (*Ailanthus fordii)* trees, 5 colonies of Lamb of Tartary (*Cibotium barometz)* and 1 no. Hong Kong Eagle's Claw (*Artabotrys hongkongensis)* was recommended to be transplanted in the approved detailed vegetation survey report.

1.4 Detailed vegetation report was planned that Incense Tree (*Aquilaria sinensi*s) and Ailanthus (*Ailanthus fordii)* trees will be transplanted within existing Sha Tin Water Treatment Works (STWTW). All other shrubs including Lamb of Tartary (*Cibotium barometz)* and Hong Kong Eagle's Claw (*Artabotrys hongkongensis)* will be transplanted to the hillside slope at Sha Tin South Fresh Water Service Reservoir (STSFWSR).

1.2 Upon the requirement of the Environmental Permit, a qualified Ecologist was commissioned to prepare a post-transplantation monitoring report to present the status (health condition and survival rate) of transplanted vegetation and submitted to the DEP.

1.3 Monitoring of transplanted flora was conducted after the transplantation. The monitoring will be conducted at twice per month during the first year and once per month during the course of planting works. The parameters to be monitoring will include the health condition and survival rate of the transplanted flora. Any observations and recommendations will be reported in monthly EM&A reports.

1.3 This is Tree Report presents data collected on 23 and 31 July 2019. It contains the following information:

- Introduction (Section 1)
- Description Of Tree Monitoring Area (Section 2)
- Monitoring Methodology (Section 3)
- Result (Section 4)
- Summary

- Photos (Appendix I)
- Summary table (Appendix II)
- Typhoon information (Appendix III)

2. DESCRIPTION OF TREE MONITORING SITE

2.1 Incense Tree (*Aquilaria sinensis*) and Ailanthus (*Ailanthus fordii*) trees was transplanted within existing Sha Tin Water Treatment Works (STWTW) where is the extended compensatory plantation area. The area was flat and without covering with concrete.

2.2 Lamb of Tartary (*Cibotium barometz*) will be transplanted to the Sha Tin South Fresh Water Service Reservoir (STSFWSR) where is currently covered with concrete. Plough is required before planting on to this area.

2.3 The planting site at Sha Tin South Fresh Water Service Reservoir (STSFWSR) was still under preparation. Lamb of Tartary (*Cibotium barometz*) to be transplanted was temporally stored at a nursery garden at Shui Mei Tsuen, Kam Tin. Once the planting site at Sha Tin South Fresh Water Service Reservoir (STSFWSR) was prepared and temporally stored transplanted vegetation were in fair condition, all transplanted Lamb of Tartary (*Cibotium barometz*) will be planted at the planting site.

3. MONITORING METHODOLOGY

3.1 Site inspection will be carried out by walking through the transplanting area. Health condition and survival rate will be observed during inspection.

3.4 Health condition of all transplanted vegetation including trees/Shrubs surveyed was evaluated according to the following criteria:

- Transplanted vegetation with good health are classified as **good**;
- Transplanted vegetation with few or no visible defects or health problems are classified as being **fair**;
- Transplanted vegetation was badly damaged or clearly suffering from decay die back or the effects of very heavy vine growth are classified as **poor**.

3.5 Survival rate for each of transplanted vegetation species will be calculated based on site observation.

4. RESULT

4.1 Monitoring inspections were conducted on 23 and 31 July 2019. Three trees TA572, TA326 and TA327 were transplanted to tree compensation area within the Sha Tin Water Treatment Works (STWTW) in 20 June 2016.

4.2 The condition of TA572 was observed in poor condition due to the damage of two main trunks. TA327 was also in poor condition. The already dead tree TA326 collapsed due to big hit by the Signal No.10 typhoon Mangkhut on 16 September 2018. Tree guying cables have been installed to provide external support to the remaining two transplanted trees.

4.3 All transplanted Lamb of Tartary (*Cibotium barometz*) have been severely damaged by Typhon Wipha on 30-31 July 2019; the next few monitoring will be critical to assess their survival and recovery progress.

4.4 Since Sha Tin South Fresh Water Service Reservoir (STSFWSR) was still under preparation, Lamb of Tartary was still temporally stored in a nursery garden at Shui Mei Tsuen, Kam Tin.

4.5 In general, all transplanted Lamb of Tartary (*Cibotium barometz*) were in poor condition while Hong Kong Eagle's Claw (*Artabotrys hongkongensis)* was observed dead during inspection on 20 August 2016. The survival rate for Lamb of Tartary (*Cibotium barometz*) and Hong Kong Eagle's Claw (*Artabotrys hongkongensis)* was 96%. The Summary table for health condition and survival rate was shown in Appendix II.

5. MITIGATION MEASURE

5.1 Hong Kong Eagle's Claw (*Artabotrys hongkongensis)* was observed dead during inspection on 20 August 2016. In order to compensate for the loss of transplanted Hong Kong Eagle's Claw which is in climber growing form, it is recommended to plant an individual of native climber species at compensatory planting site (Sha Tin South Fresh Water Service Reservoir (STSFWSR)) together with compensatory tree planting. Recommended list of species are given in the Table 1 below. It is suggested that about 1 species of climber to be selected from the following list according to availability of the nursery source. The recommended plant species have been recorded from adjacent secondary woodland in an approved EIA Report (AEIAR-187/2015). These species would have certain ecological value in terms of plant ecology and the associated wildlife including birds.

Table 1. Table for Recommended climber species list to be planted

Native Tree Species			
Common Name	**Latin Name**	**Chinese Name**	**Growing Form**
Climbing Bauhinia	*Bauhinia glauca*	粉葉羊蹄甲	Climber

Spiny-fruited Vine	*Byttneria aspera*	刺果藤	Climber
Bentham,s Rose-wood	*Dalbergia benthamii*	兩廣黃檀	Climber
Desmos	*Desmos chinensis*	假鷹爪	Climber
Glaucescent Diploclisia	*Diploclisia glaucescens*	蒼白秤鈎風	Climber
Luofushan Joint-fir	*Gnetum luofuense*	羅浮買麻藤	Climber
Australian Cow-plant	*Gymnema sylvestre*	匙羹藤	Climber
Shining Hypserpa	*Hypserpa nitida*	夜花藤	Climber
Large-floweredHoneysuckle	*Lonicera macrantha*	大花忍冬	Climber
Splash-of-white	*Mussaenda pubescen*	玉葉金花	Climber
Rusty-haired Raspberry	*Rubus reflexus*	鏽毛莓	Climber
Sandpaper Vine	*Tetracera asiatica*	錫葉藤	Climber
Hong Kong Eagle's Claw	*Artabotrys hongkongensis*	鷹爪花	Climber

5.2 All transplanted Lamb of Tartary (*Cibotium barometz*) had shown yellow foliage, probably due to high exposure of sunlight at the new nursery site before the hit of Typhoon Wipha. It is recommended to retain them at the nursery garden under proper maintenance during current recovery stage. Shelter (such as 遮光網) shall be provided to reduce the amount of sunlight received and avoid direct hit of rainstorm/ typhoon. Once their condition has recovered to acceptable level, they can be moved to the transplantation site at Sha Tin South Fresh Water Service Reservoir (STSFWSR) when the site is ready.

5.3 After transplantation, root ball of TA572 and TA327 tree should be kept moisture especially during non-raining day.

5.4 Incense Tree (*Aquilaria sinensis*) tagged as TA326 was observed dead during inspection on 10 August 2017. Its DBH was measured as 346cm. In according to the Tree Preservation, Development Bureau Technical Circular (Works) No. 7/2015, the compensatory planting will try to achieve the compensatory planting ratio of 1:1 in terms of aggregated DBH.

5.5 In total, 3 individual of native tree species with heavy standard size will be planted with 2.5-3 meters (center to center) spacing at compensatory planting site. Recommended list of species are given in the Table 2 below. It is suggested that at least 1 tree species to be selected from the following list according to availability of the nursery source. The recommended plant species have been recorded from adjacent secondary woodland in an approved EIA Report (AEIAR-187/2015). These species would have certain ecological value in terms of plant ecology and the associated wildlife including birds.

Table 2. Table for Recommended tree species list to be planted

Native Tree Species			
Common Name	**Latin Name**	**Chinese Name**	**Growing Form**

Ivy Tree	*Schefflera heptaphylla*	鴨腳木	Tree
Levine's Syzygium	*Syzygium levinei*	山蒲桃	Tree
Chekiang Machilus	*Machilus chekiangensis*	浙江潤楠	Tree
Aporusa	*Aporusa dioica*	銀柴	Tree
Mountain Tallow Tree	*Sapium discolor*	山烏桕	Tree
Fragrant Litsea	*Litsea cubeba*	山蒼樹	Tree
Chinese Apea Ear-ring	*Archidendron lucidum*	亮葉猴耳環	Tree
Chinese Hackberry	*Celtis sinensis*	朴樹	Tree
Turn-in-the-wind	*Mallotus paniculatus*	白楸	Tree
Acronychia	*Acronychia pedunculata*	降真香	Tree

6. SUMMARY

6.1 The condition of TA572 was observed in poor condition due to broken of main trunk. TA327 was also in poor condition; while already dead TA326 collapsed under Signal No. 10 typhoon Mangkhut in September 2018. Tree guying cables have been installed to provide external support to the two remaining transplanted trees.

6.2 All transplanted Lamb of Tartary (*Cibotium barometz*) have been severely damaged by Typhon Wipha on 30-31 July 2019. A few new fronds of transplanted Lamb of Tartary were still observed growing out. Next few monitoring will be critical to assess their survival and recovery progress. Shelter (遮光網) was recommended to reduce the intensity of sunlight and avoid direct hit of rainstorm/ typhoon. Currently, Lamb of Tartary was temporally stored in a nursery garden at Shui Mei Tsuen, Kam Tin. It is recommended to retain them at the nursery garden under proper maintenance during current recovery stage. Hong Kong Eagle's Claw (*Artabotrys hongkongensis*) was observed dead during inspection on 20 August 2016.

6.3 In general, all transplanted Lamb of Tartary (*Cibotium barometz*) were in poor condition while Hong Kong Eagle's Claw (*Artabotrys hongkongensis*) and one Incense Tree (*Aquilaria sinensis*) TA326 were observed dead during inspection on 20 August 2016 and on 10 August 2017 respectively.

6.4 In order to compensate for the loss of transplanted Hong Kong Eagle's Claw and Incense Tree, it is recommended to plant an individual of native climber species and 3 heavy standard native tree species at compensatory planting site. The suggested species in planting list would have certain ecological value in terms of plant ecology and the associated wildlife including birds.

6.5 After transplantation, root ball of TA572 and TA327 tree should be kept moisture especially during dry and non-raining day.

APPENDIX I

Photo

Photo 1. General view of *Cibotium barometz* to be transplanted.

Photo 2. *Cibotium barometz* severely damaged by Typhoon Wipha

Photo 3. *Cibotium barometz* severely damaged by Typhoon Wipha

Photo 4. *Cibotium barometz* severely damaged by Typhoon Wipha

Photo 5 & 6. New sprout of *Cibotium barometz*.
Shelter (such as 遮光網) is recommended for reducing intensity of sunlight and avoid direct hit of rainstorm/ typhoon on the plants.

Photo 7. Transplanted Incense Tree (*Aquilaria sinensis*) – TA327 (left);
and Ailanthus (*Ailanthus fordii*) – TA572 (right)

Photo 8. Weak crown with dead twigs observed in of TA327.

Photo 9. Watersprouts at lower trunk of TA327.

	
Photo 10. Cracks and wounds observed in one of the trunks of TA572.	Photo 11. Weak crown and two broken trunks of TA572.

APPENDIX II

Table for condition of transplanted plant

Shrubs of Lamb of Tartary and Hong Kong Eagle's Claw

No.	Species	Condition	Alive/Dead	Remark
1	*Cibotium barometz*	Poor	Alive	
2	*Cibotium barometz*	Poor	Alive	
3	*Cibotium barometz*	Poor	Alive	
4	*Cibotium barometz*	Poor	Alive	
5	*Cibotium barometz*	Poor	Alive	
6	*Cibotium barometz*	Poor	Alive	
7	*Cibotium barometz*	Poor	Alive	
8	*Cibotium barometz*	Poor	Alive	
9	*Cibotium barometz*	Poor	Alive	
10	*Cibotium barometz*	Poor	Alive	
11	*Cibotium barometz*	Poor	Alive	Severely damaged by Typhon Wipha on 30-31 July 2019 ; the next few monitoring will be critical to assess their survival and recovery progress
12	*Cibotium barometz*	Poor	Alive	
13	*Cibotium barometz*	Poor	Alive	
14	*Cibotium barometz*	Poor	Alive	
15	*Cibotium barometz*	Poor	Alive	
16	*Cibotium barometz*	Poor	Alive	
17	*Cibotium barometz*	Poor	Alive	
18	*Cibotium barometz*	Poor	Alive	
19	*Cibotium barometz*	Poor	Alive	
20	*Cibotium barometz*	Poor	Alive	
21	*Cibotium barometz*	Poor	Alive	
22	*Cibotium barometz*	Poor	Alive	
23	*Cibotium barometz*	Poor	Alive	
24	*Cibotium barometz*	Poor	Alive	
25	*Cibotium barometz*	Poor	Alive	
26	*Cibotium barometz*	Poor	Alive	
27	*Cibotium barometz*	Poor	Alive	
	Shelter (such as 遮光網) is recommended for reducing intensity of sunlight and direct hit of rainstorm/ typhoon on the plants.			
28	*Artabotrys hongkongensis*	--	Dead	--
		Survival rate (%)	96%	

Trees of Ailanthus and Incense Tree

No.	Species	Condition	Alive/Dead	Remark
TA572	*Ailanthus fordii*	Poor	Alive	Two main trunks were broken during typhoon on 23 August 2017. Cracks and wounds observed in one of the trunks. Weak canopy formed only by sprouts.
TA327	*Aquilaria sinensis*	Poor	Alive	Tree crown of TA327 was thinner after transplantation. Water sprouts and cracks on tree bark observed.
TA326	*Aquilaria sinensis*	Dead	Dead	Collapsed due to the Signal No.10 typhoon Mangkhut in September 2018.
		Survival rate (%)	67%	

Appendix T
Monthly Summary of Waste Flow Table

Water Supplies Department
Monthly Summary Waste Flow Table
for Contract with Environmental Management Plan under ETWB TCW No. 19/2005 and its Interim Guidance Note
Reporting Year: 2019
Contract No. 3/WSD/15

(To be submitted to C&D MM Coordinator of Respective Division/Region via Engineer's Representative before 15th of the following month)

Month	Actual Quantities of Inert C&D Materials Generated / Imported (in '000 m^3)						Actual Quantities of Other C&D Materials / Wastes Generated				
	Total Quantities Generated [a+b+c+d]	Broken Concrete (including rock for recycling into aggregates) (a)	Reused in the Contract (b)	Reused in Other Projects (c)	Disposed as Public Fill (d)	Imported C&D Material	Metal (in '000kg)	Paper/ Cardboard Packaging (in '000kg)	Plastic (bottles/containers, plastic sheets/ foams from package material) (in '000kg)	Chemical Waste (in '000kg)	Others (e.g. General Refuse etc.) (in '000m^3)
January	1.754	0.000	0.000	0.000	1.754	0.000	0.000	0.000	0.000	0.000	0.047
February	0.275	0.000	0.000	0.000	0.275	0.000	0.000	0.000	0.000	0.000	0.030
March	0.621	0.000	0.000	0.000	0.621	0.000	0.000	0.000	0.000	0.000	0.095
April	0.467	0.000	0.000	0.000	0.467	0.000	0.000	0.000	0.000	0.000	0.086
May	0.581	0.000	0.000	0.000	0.581	0.000	0.000	0.000	0.000	0.000	0.080
June	0.664	0.000	0.000	0.000	0.664	0.000	0.000	0.000	0.000	0.000	0.063
Half-year total	4.362	0.000	0.000	0.000	4.362	0.000	0.000	0.000	0.000	0.000	0.401
July	0.617	0.000	0.000	0.000	0.617	0.000	0.000	0.000	0.000	0.000	0.075
August	0.000										
September	0.000										
October	0.000										
November	0.000										
December	0.000										
Yearly Total	4.979	0.000	0.000	0.000	4.979	0.000	0.000	0.000	0.000	0.000	0.476

Appendix U
Implementation Schedule of Environmental Mitigation Measures (EMIS)

Environmental Mitigation and Enhancement Measure Implementation Schedule at Construction Stage

EIA Ref.	Recommended Mitigation Measures	Location of the Measures	Implementation Agent	Relevant Legislation and Guidelines	Implementation Phase			Status
					D	C	O	
Air Quality								
4.7.1	Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather.	All works areas	Contractor	Air Pollution Control Ordinance and Air Pollution Control (Construction Dust) Regulation EM&A Manual		√		Y
4.7.1	Side enclosure and covering of any aggregate or stockpiling of dusty material to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines.	All works areas	Contractor			√		Y
4.7.1	Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations.	All works areas	Contractor			√		Y
4.7.1	Establishment and use of vehicle wheel and body washing facilities at the exit points of the site.	All works areas	Contractor			√		Y
4.7.1	Imposition of speed controls for vehicles on site haul roads.	All works areas	Contractor			√		Y
4.7.1	Implement EM&A program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.	All works areas / Monitoring points	Contractor			√		Y
Noise								
5.6.4	Implement good site practices to reduce noise level	All works areas	Contractor	Noise Control Ordinance		√		Y
5.6.5	Adoption of Quiet PME	All works areas	Contractor			√		N/A
5.6.6	Use of Movable Noise Barrier	All works areas	Contractor			√		N/A
5.8	Noise monitoring	Monitoring points	Contractor			√		Y
Water Quality								
6.8.1	Surface run-off from construction sites should be discharged into storm drains via adequately designed sand/silt removal facilities such as sand	All works areas	Contractor	ProPECC PN 1/94 Construction		√		Y

	traps, silt traps and sedimentation basins. Channels or earth bunds or sand bag barriers should be provided on site to properly direct stormwater to such silt removal facilities. Perimeter channels at site boundaries should be provided where necessary to intercept storm run-off from outside the site so that it will not wash across the site. Catchpits and perimeter channels should be constructed in advance of site formation works and earthworks.			Site Drainage TM-DSS Water Pollution Control Ordinance				
6.8.2	Silt removal facilities, channels and manholes should be maintained and the deposited silt and grit should be removed regularly, at the onset of and after each rainstorm to prevent local flooding.	All works areas	Contractor			√		Y
6.8.3	Temporary exposed slope surfaces should be covered and temporary access roads should be protected by crushed stone or gravel, as excavation proceeds. Intercepting channels should be provided to prevent storm run-off from washing across exposed soil surfaces.	All works area	Contractor			√		Y
6.8.4	Earthworks final surfaces should be well compacted and the subsequent permanent work or surface protection should be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate drainage like intercepting channels should be provided where necessary.	All works areas	Contractor			√		N/A
6.8.5	Rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities.	All works areas	Contractor			√		Y
6.8.6	Open stockpiles of construction materials (e.g. aggregates, sand and fill material) on sites should be covered with tarpaulin or similar fabric during rainstorms.	All works areas	Contractor			√		Y
6.8.7	Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system.	All works areas	Contractor			√		Y
6.8.8	Good site practices should be adopted to remove rubbish and litter from construction sites so as to prevent the rubbish and litter from spreading from the site area.	All works areas	Contractor			√		Y
6.8.9	All vehicles and plant should be cleaned before they leave a construction site to minimize the deposition of earth, mud, debris on roads. A wheel washing bay should be provided at every site exit if practicable and wash-water should have sand and silt settled out or removed before discharging into storm drains.	All works areas	Contractor			√		Y
6.8.10	Before commencing any demolition works, all drainage connections should be sealed to prevent building debris, soil, sand etc. from entering	All works areas	Contractor			√		N/A

	drains.							
6.8.11	Wastewater generated from building construction activities including concreting, plastering, internal decoration, cleaning of works and similar activities should not be discharged into the stormwater drainage system. If the wastewater is to be tankered off site for disposal into foul sewers, it should undergo the removal of settleable solids in a silt removal facility, and pH adjustment as necessary.	All works areas	Contractor			√		Y
6.8.12	Acidic wastewater generated from acid cleaning, etching, pickling and similar activities should be neutralized to within the pH range of 6 to 10. The neutralized wastewater should be tankered off site for disposal into foul sewers or treated to a standard acceptable to storm drains and the receiving waters.	All works areas	Contractor			√		N/A
6.8.13	All surface run-off must proper collected and discharge at designated location. The discharge quality must meet the requirements specified in the discharge license.	All works areas	Contractor			√		Y
6.8.15	Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes.	All works areas	Contractor			√		Y
6.8.16	Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should only be undertaken within the areas appropriately equipped to control these discharges	All works areas	Contractor			√		Y
6.8.17	Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance.	All works areas	Contractor			√		Y
6.8.18	Sewage generated from the workforce should be properly treated by interim treatment facilities, such as chemical toilets which are properly maintained with the employment of licensed collectors for the collection and disposal on a regular basis.	All works areas	Contractor			√		Y
6.8.19	Adopt relevant measures stated in ETWB TC (Works) No. 5/2005 “Protection of Natural Streams/rivers from Adverse Impacts arising from Construction Works” to minimize the potential water quality impacts from the construction works near any water courses.	All works areas	Contractor			√		Y
6.10	Water quality monitoring	Monitoring points	Contractor			√		Y
Waste Management								

7.6.1	Appropriate waste handling, transportation and disposal methods for all waste arisings generated during the construction works for the Project should be implemented to ensure that construction wastes do not enter the nearby streams or drainage channel.	All works areas	Contractor	Waste Disposal Ordinance DEVB TCW No. 6/2010, ETWB TCW No. 19/2005 Land (Miscellaneous Provisions) Ordinance Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes		√		Y
7.6.2	Implementation of good site practices for waste management	All works areas	Contractor			√		Y
7.6.3	Implementation of trip ticket system to control waste disposal	All works areas	Contractor			√		Y
7.6.4	Implementation of good site practices to reduce waste generations	All works areas	Contractor			√		Y
7.6.5	Re-use of excavated C&D materials on site as far as practical. A suitable area should be designated within the site for temporary stockpiling of C&D material and to facilitate the sorting process.	All works areas	Contractor			√		Y
7.6.8	General refuse should be stored in enclosed bins or compaction units separate from C&D material. A reputable waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D material.	All works areas	Contractor			√		Y
7.6.9	All storage of asbestos waste should be carried out properly in a secure place isolated from other substances so as to prevent any possible release of asbestos fibres into the atmosphere and contamination of other substances. The storage area should bear warning panels to alert people of the presence of asbestos waste.	All works areas	Contractor			√		N/A
7.6.10	A licensed asbestos waste collector will be appointed to collect the asbestos waste and deliver to the designated landfill for disposal. Application should be submitted to EPD.	All works areas	Contractor			√		N/A
7.6.11	If chemical wastes were to be produced at the construction site, the Contractor would be required to register with the EPD as a Chemical Waste Producer, and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor shall use a licensed collector to transport the chemical wastes. The licensed collector shall deliver the waste to the Chemical Waste Treatment Centre at Tsing Yi, or other licenced facility, in accordance with	All works areas	Contractor			√		Y

	the Waste Disposal (Chemical Waste) (General) Regulation.							
Ecology								
8.8.1	Ecological impacts on important habitats and the associated wildfile caused by the proposed development should be mitigated and compensation approaches to the maximum practical extent	All works areas in particular important habitats All works areas	The Engineer/ Contractor	EIAO-TM EM&A Manual		√		Y
8.8.2	Reduce the amount of vegetation removal required and thereby minimize the footprint of the slope at the woodland habitat		The Engineer/ Contractor			√		Y
8.8.3	Conduct detailed vegetation survey and implement suggested measures for species of conservation importance.		The Engineer/ Contractor			√		Y
8.8.4	The affected Incense Tree and Ailanthus as mentioned in the detailed vegetation survey report within the works area will be transplanted		The Engineer/ Contractor			√		Y
8.8.5	To avoid impacts on Short-nosed Fruit Bat, the tree with records of an active roost and trees showing evidence of roosting activity should be retained where possible. Where Chinese Fan-palm (Livistona chinensis) removal is required, these should be checked by suitably qualified ecologist with over 7 years relevant experience for roosting bats prior to their removal. If roosting bats are observed, a strategy for passive removal will be agreed with the AFCD and implemented. This could include undertaking the works just after the bats have left the roost (i.e. dusk).		The Engineer/ Contractor			√		N/A
8.8.6	The inclusion of Chinese Fan-palm of similar size as the affected plant within the areas of compensatory planting or other suitable areas is recommended to replace affected specimens, and compensate for the impact to roosting opportunities for this bat species		The Engineer/ Contractor			√		N/A
8.8.7	Implement good site measures to minimize the disturbance impacts to terrestrial habitat and associated wildlife arising from the land-based construction activities.		The Engineer/ Contractor			√		Y
8.8.8	To minimize the contamination of wastewater discharge, accidental chemical spillage and construction site run-off to the receiving water bodies, mitigation measures such as diverting the site runoff to silt trap facilities before discharging into storm drain, proper waste and dumping management and standard good site practice for land-based construction.		The Engineer/ Contractor			√		Y
8.8.9-8.8.11	Implement woodland compensation		The Engineer/ Contractor			√		N/A

Landscape and Visual								
9.8.1	Existing tress to be retained on site shall be carefully protected during construction. Trees unavoidably affected by the works shall be transplanted as far as possible.	All works areas	Contractor	DEVB TCW No. 10/2013 EIAO TM		√		Y
	Compensatory Planting shall be provided in accordance with DEVB TCW No. 10/2013 – Tree Preservation.	All works areas	Contractor			√		Y
	Control of night-time lighting glare.	All works areas	Contractor			√		Y
	Erection of decorative screen hoarding compatible with the surrounding setting.	All works areas	Contractor			√		Y
	Management of facilities on work sites which give control on the height and disposition/arrangement of all facilities on the works site to minimize visual impact to adjacent VSRs.	All works areas	Contractor			√		Y
Cultural Heritage								
10.6.2	Vibration monitoring at Ex KCR Beacon Hill Tunnel during piling works of Administration Building	Work site	The Engineer /Contractor			√		N/A
Land Contamination								
11.7	Identify contamination and implement appropriate remedial measures on site. Provide relevant submission and obtain approval from EPD if necessary.	All works areas	Contractor	Guidance Note for Contaminated Land Assessment and Remediation Guidance Manual for Use of Risk based Remediation Goals for Contaminated Land Management (Guidance Manual)		√		N/A
Hazard to Life								
Table 12.22	Ensure speed limit enforcement is specified in the contractor's Method Statement to limit the speed of construction vehicles on site	All works areas	The Engineer	EIAO-TM		√		Y
	Develop an audit procedure to ensure enforcement of speed limits and to ensure adequate site access control	All works areas	The Engineer			√		Y
	Ensure construction method statement is endorsed by the Engineer (AECOM)	All works areas	The Engineer			√		Y

	Ensure designated manoeuvring area for the new access road construction is away from the Chlorination House	New access road area	Contractor/ The Engineer			√		Y
	Ensure that the emergency response plan and procedures (including drills) cover the reprovisioning activities	All works areas	Contractor/ The Engineer			√		Y
	Safety training to be provided to construction workers and WSD/Engineer staff regarding evacuation procedures	All works area	Contractor/ The Engineer			√		Y
	Ensure communication protocol is in place between construction and operation staff with regard to the change of chlorine delivery route and the switchover from the existing to new chlorinated water piping;	All works areas	Contractor/ The Engineer			√		N/A
	Ensure temporary suspension of crane operation and construction truck movements during chlorine delivery	All works areas	Contractor/ The Engineer			√		Y
	Provide a crash barrier between the construction site and the north side of the Chlorination House.	Chlorination House area	Contractor			√		Y
	Conduct vibration monitoring at the Chlorination House during piling activities to ensure vibration levels are acceptable and will not lead to any damage of the Chlorination House	Chlorination House area	Contractor			√		Y
	Civil engineering calculation to be performed to confirm differential settlement from excavation work is within acceptable limits for the Chlorination House	Chlorination House area	Contractor			√		Y
	Provide settlement monitoring for the Chlorination House to ensure no subsidence occurs from nearby excavation works.	Chlorination House area	Contractor			√		Y
	Confirm the chlorine concentration for the chlorinated water before the switchover from the existing to new piping. This is to avoid the potential for chlorine gas vapours being released if the concentration is too high and there is spillage during switchover	Chlorinated water piping	WSD			√		N/A
	Develop an operating procedure for performing the chlorinated water switchover from the existing piping to new piping.	All works areas	Contractor/ The Engineer / WSD			√		N/A
	Ensure the location/height of the lifting equipment is such there is no impact on Chlorination House/chlorine delivery route in case of falling, swinging or dropped load.	Chlorination House area	Contractor/ The Engineer			√		Y
	Implement the controlled demolition of the existing E&M workshop to ensure that any steel structural elements can only fall away from the Chlorination House	Existing E&M Workshop and Chlorination House	Contractor/ The Engineer			√		N/A

	areas							
Stop any construction activities which may lead to vibrations and potential slope/boulder disturbance during the chlorine deliveries	All works areas	Contractor			√		Y
Installation of Chlorine gas monitors with audible alarms in the relevant reprovisioning works area	Reprovisioning works areas	Contractor/ The Engineer			√		k.i.v.
Provision of an accompanying vehicle for the chlorine truck on the WTW site and ensuring that during the chlorine drums delivery construction works are stopped and the construction workers moved away from Chlorination House	All works areas	Contractor			√		Y
Establish a liaison between the contractor and HKCG and develop a chlorine/town gas emergency plan to ensure gas safety during the Construction Phase	Beacon Hill North Gas Offtake Station and Gas Pipelines in Old Beacon Hill Tunnel	The Engineer / Contractor / HKCG			√		k.i.v.
Temporary suspend chlorine delivery during the short period of construction of the concerned section of elevated walkway to avoid mobile crane impact on the chlorine truck		The Engineer / Contractor			√		N/A
Provide clear road signs for site vehicles	Chlorine delivery route and reprovisioning works access roads	The Engineer / Contractor			√		Y
Large equipment/plant movement should be controlled by 'Permit-to-move' system	All works areas	The Engineer / Contractor / WSD			√		Y
Define restricted zone for the equipment (i.e. keep the equipment from the Chlorination House at a safe distance). The extent of the restricted zone would be determined by the size of the equipment	Chlorination House area	The Engineer / Contractor			√		Y
Locate the construction site office at or near property boundary away from the Chlorination House as far as possible	Construction Office area	The Engineer / Contractor			√		Y
Entry of non-authorized personnel to the construction site to be prohibited	All works areas	Contractor			√		Y

12.15.4, 12.18.1, 12.22.9	GPS fleet management system with driver training to help enforce truck speeds	Chlorine delivery trucks, fleet management centre	WSD / Chlorine Supply Contractor	EIAO-TM		√		k.i.v.
	Improved clamps with independent checks to prevent load shedding	Chlorine delivery trucks				√		F
	Installation of fire screen and larger fire extinguishers to prevent engine and wheel fires from spreading to the cargo area					√		F
	Adoption of the chlorine delivery route from Sham Shui Kok Dock to Sha Tin WTW					√		F
	Provision of emergency repair kit					√		F
12.34.3 Table 12.37 & 12.38	Ban the use of retreaded tyres and perform regular visual checks on the tyres.					√		F
	A vehicle accompanying chlorine truck along critical road sections in Sha Tin. The truck should be equipped with emergency kit, fire extinguisher, radio set for communication. The accompanying vehicle will be ahead of the chlorine truck after the vehicles entering the water treatment works site – An accompanying vehicle may provide rapid response to an incident but any action would be limited to containing a small leak.					√		F
	Limit fuel tanks capacity at the beginning of the Project (Item 2.3 of Table 12.37 – advance measure).					√		F
	Review the practicality of reducing combustible materials or use of fire retardant materials in the cab. (Item 2.3 of Table 12.37 – further measure)					√		k.i.v.
	Annual periodic radiography or ultrasonic test inspections of the chlorine drums should be considered for implementation as soon as feasible (Item 3.8 of Table 12.37).	Chlorine drums				√		k.i.v.
	Implement side, front and rear crash guards with high energy absorption in coordination and accordance with the relevant authorities.	Chlorine delivery trucks				√		k.i.v.
	Implement a sturdy steel frame to minimize the potential for chlorine release due to truck rollover					√		k.i.v.
12.34.4	WSD will continue to keep under review the latest development of use of alternative disinfectants in water supply industry to aim at minimising on-site chlorine storage.4	Chlorine delivery Route	WSD			√		k.i.v.

	Training should be provided for the use of the GPS fleet management and improved safe driving.					√		k.i.v.
	Ensured that independent checks are performed to ensure proper chlorine drum latching and clamping.					√		F
	Chlorine truck drivers or driver attendants should be further trained to check and detect potential chlorine leaks during transport. This should include the timely application of the emergency kit.					√		k.i.v.
	Training should be provided to driver and driver attendant for the emergency use of the new 2 × 9L AFFF extinguishers.					√		F
	Induction training for new drivers and driver attendant should include familiarisation with the route, familiarisation with chlorine risks, defensive driving, application of emergency kits, use of fire extinguishers and emergency response					√		k.i.v.
	Provision of a fire screen between the cab and cargo as well as fire retardant materials for the wheel arches on the chlorine truck should be planned and provided					√		F
	To keep under review alternate chlorine receiving dock in Sha Tin/Tai Po area for chlorine delivery to STWTW.					√		k.i.v.

Legend

D – Design Phase

C – Construction Phase

O – Operation Phase

Y - Compliance of Mitigation Measures

N/A – Not Applicable in Reporting Period

k.i.v – Keep In View

F - Completed

Appendix V
Cumulative Statistics on Exceedances, Complaints, Notifications of Summons and Successful Prosecutions

Statistical Summary of Exceedances

Air Quality			
Location	**Action Level**	**Limit Level**	**Total**
AM1	0	0	0
AM2	0	0	0
Noise			
Location	**Action Level**	**Limit Level**	**Total**
NM1	0	0	0
NM2	0	0	0
NM3	0	0	0

Water Quality

Location	**Action Level**				**Limit Level**				**Total**
	DO	**Turbidity**	**SS**	**pH**	**DO**	**Turbidity**	**SS**	**pH**	
C1	0	0	0	0	0	0	0	0	0
C2	0	0	0	0	0	0	0	0	0
C3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0
M1	0	0	0	0	0	0	0	0	0
M2	0	0	0	0	0	0	0	0	0
M3	0	0	0	0	0	0	0	0	0

Statistical Summary of Environmental Complaints

Reporting Period	**Environmental Complaint Statistics**		
	Frequency	**Cumulative**	**Complaint Nature**
1 June- 30 June	0	0	N/A

Statistical Summary of Environmental Summons

Reporting Period	**Environmental Summons Statistics**		
	Frequency	**Cumulative**	**Details**
1 June- 30 June	0	0	N/A

Statistical Summary of Environmental Prosecution

Reporting Period	**Environmental Prosecution Statistics**		
	Frequency	**Cumulative**	**Details**
1 June- 30 June	0	0	N/A

Appendix W
Tentative schedule for environmental monitoring

Impact Monitoring Schedule for STWTW

Jun-19

Sun	Mon	Tue	Wed	Thur	Fri	Sat
						1
2	3 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	4	5	6 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	7	8 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3
9	10 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	11	12 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	13	14 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	15
16	17 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	18	19 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	20	21 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	22
23	24 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	25	26 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	27	28 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	29
30						

Impact Monitoring Schedule for STWTW

Jul 19						
Sun	Mon	Tue	Wed	Thur	Fri	Sat
	1	2 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	3	4 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	5	6 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3
7	8 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	9	10 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	11	12 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	13
14	15 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	16	17 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	18	19 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	20
21	22 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	23	24 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	25	26 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	27
28	29 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	30	31			

Impact Monitoring Schedule for STWTW

Aug 19						
Sun	Mon	Tue	Wed	Thur	Fri	Sat
				1 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	2	3 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3
4	5 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	6	7 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	8	9 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	10
11	12 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	13	14 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	15	16 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	17
18	19 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	20	21 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	22	23 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	24
25	26 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	27	28 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	29	30 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	31

Impact Monitoring Schedule for STWTW

Sep-19						
Sun	Mon	Tue	Wed	Thur	Fri	Sat
1	2 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	3	4 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	5	6 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	7
8	9 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	10	11 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	12	13 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	14
15	16 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	17	18 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	19	20 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	21
22	23 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	24	25 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	26	27 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	28
29	30 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3					

Oct 19						
Sun	Mon	Tue	Wed	Thur	Fri	Sat
		1	2 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	3	4 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	5
6	7	8 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	9	10 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	11	12 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3
13	14 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	15	16 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	17	18 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	19
20	21 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	22	23 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	24	25 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	26
27	28 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	29	30 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	31		